

**INFLUENCE OF PROJECT PLANNING ON SUSTAINABILITY OF ROAD
CONSTRUCTION PROJECTS IN NAIROBI CITY COUNTY, KENYA: A CASE OF
CHINA WUYI COMPANY LIMITED**

SAMUEL NDUNGU MBURU

**A RESEARCH PROJECT SUBMITTED TO THE SCHOOL OF MANAGEMENT AND
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AT THE MANAGEMENT UNIVERSITY OF AFRICA**

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DECLARATION

This project is my original work and has not been presented to any other university.

Signature.....

Date.....

Samuel Ndungu Mburu

ODL-BDS/2/00016/1/2014

This research has been submitted for my approval as the Management University of Africa Supervisor.

Signature:

Date.....

Ms. Juster G. Nyaga

DEDICATION

I would like to dedicate this work to my lovely Boys (Gideon and Japheth), for their continued moral and caring encouragement during my course and research period. You are my hope, my future and my drive in this challenging life.

ACKNOWLEDGEMENT

The management staff of China WuYI Co; Limited, for their understanding and the consequent permission to use their organization as my case study. The entire staff of the Management University of Africa for all the support they accorded me without which this research would not have been possible.

I am grateful to Ms. Juster G. Nyaga, my research supervisor, for direction and wise counsel throughout my project. I am equally grateful to my colleagues for all their contribution during this time I was involved in my research work.

ABSTRACT

The purpose of this study was to examine the influence of project planning on sustainability of road construction projects in Kenya. The study sought to find out how project cost management, project quality management, project timeliness management, project deliverables management and project evaluation management affects sustainability of road construction projects. The study used descriptive research design. A sample of 324 employees that represented 30% of the target population was selected. The target population comprised of six directors, top managers and other employees. Stratified random sampling method was used to arrive at the sample size. Stratified random sampling method was used picking a sample size of 30%, which was 99 and the response rate was 67 (representing 70%). The study used questionnaires which were reviewed to answer research questions. This study is important because road construction infrastructure is key to economic growth. It helps to reduce and eradicate poverty in nations through the enhancement of competition, facilitates trade and integration of international community. As infrastructure reaches to business regions and accommodate investment, each access to products and services as well as employing more people. It contributes to economic sustainability, growth and development raising revenue for the government and national development. Therefore, the issue of lack of sustainability of road construction projects in Kenya should be addressed through outlining the project planning management techniques.

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OPERATIONAL DEFINATION OF TERMS

Project: A human undertaking of coordinated task, with a specified unique objective to be accomplished within a given duration, budget and Specification

Project co-coordinator: A project Management

Project Planner: A person who do planning

LIST OF ABBREVIATIONS AND ACRONYMS

CPM:	Critical Path method
CWY:	China Wuyi Company
NGO:	Non-Governmental organizations
PERT:	Program Evaluation and Review Technique
PMI:	Project Management Institute
RFP:	Request for Funds Proposal
WBS:	Work Breakdown Structure
WB:	World Bank
AfDB:	African Development Bank
KeNHA:	Kenya National Highway Authority
KuRA:	Kenya Urban Roads Authority
KeRRA:	Kenya Rural Roads Authority
KPI:	Key Performance Indicators
PMBOK:	Project Management Body of Knowledge
BOR:	Basis of Estimates
CBS:	Cost Breakdown Structure
ERP:	Enterprises Resources Planning
MRP:	Manufacturing Resource Planning
DRP:	Distribution Resource Planning

TQC:	Total Quality Control
ISO:	International Standard Organization
SMART:	Specific, Measurable, Achievable, Realistic, And Timelines
WBP:	Work Breakdown Plan.
PMO:	Project Management Office.
PM.:	Project Manager
PPM:	Project Portfolio Management
HBR:	Harvard Business Review
BS:	British Standards
KRS:	Kenya Roads Standards
PMP:	Project Management Professional
PCM:	Project Cost Management
PQM:	Project Quality Management
PTM:	Project Timelines Management
PDM:	Project Deliverables Management
PEM:	Project Evaluation Management
GTD:	Get Things Done
QA:	Quality Assurance
SPSS:	Statistical Package for Science systems
RR:	Response Rate

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter contains the background information which introduces the study, the problem statement, the research objectives and their respective questions, the significance of the study, limitations and finally the scope of the study

1.1 Background Information for the study

Project Planning and knowledge sharing is a crucial aspect for sustainably and responsibly growth and expansion of projects of road construction in Kenya. A sequence of processes including several techniques and methods of project planning management are essential in Project Cost Management, Project quality management, project Timeline Management, Project Deliverables Management, and project evaluation Management of projects to ensure sustainability of road construction projects.

Roads are integral in the connection of the communities' functions in Kenya. In Kenya, only 14,000 km of road network that has been tarmacked out of more than 300,000 total roads network in Kenya from year 1900. Therefore, after more than 100 years, only 5% of road network are paved, and 70% of this tarmacked road are in dilapidating state and therefore not sustainable as per KeNHA website (www.kenha.co.ke) Up to date the road sector in Kenya has not developed its manual or Kenya roads standards (KRS). The road sector still uses the British standards (BS) which are almost obsolete and have been overtaken by new designs and new road construction technology. The designs construction and functions of these roads are somewhat difficult from a sustainability perspective. The achievement on sustainability is dependent on establishing initiatives that facilitate management of the Project Cost Management, Project quality management, project Timeline Management, Project Deliverables Management, and project evaluation Management, of road construction projects as explained by Harvard Business Review organisation (HBR.org)

Also, referred to as work breakdown plan, (WBP) Project Planning involves an arrangement of stages, duties and tasks hierarchically arranged to be executed in projects as explained by (Kerzner, 2003) on project planning techniques and system approach on projects planning. After the work breakdown plan is completed, the duties and activities are evaluated, arranged accordingly and allocated resources and the establishment of a project blueprint and ensure sustainability of road construction project. Thus, Project planning involves implementation of skills, practices, and comprehension of tools to the activities of a project to outlive the expectations and needs of the stakeholders in a project and ensure sustainability.

First, project planning deals more with project cost management that involves cost control, cost budgeting, resource planning and cost estimation. The contribution of the Project planning guarantees success and long-term sustainability as expounded by (John. F. Filicetti, 2009), a veteran sales Engineer/PM-PMO-PPM with wealth of knowledge and proficiency in enterprise, project management methodologies, project management, Project Management Offices (PMOs) and Project Portfolio Management (PPM). When project management is not involved project overruns hence the issue of unsustainability common in road construction projects. Therefore, to ensure no cost overruns and there is sustainability on road construction projects, project cost management, a variable of project planning should be well involved.

Secondly, project planning pacts with project quality management employs five mechanisms; quality assurance, quality control, quality planning quality satisfaction and repeated enhancement. These consist of procedures, tools and techniques involved to guarantee that the outputs and gains align to customer needs as described by (Rose, Kenneth H, July 2005). When Project quality management is compromised, then the overall sustainability of road construction projects is really affected and does not meet the needs of present and the future. In most cases Roads develop quality problems of cracking, potholes and bitumen diddles and hence the roads become unpassable affecting the comfort and safety of users. To ensure sustainability of the road construction projects, the project quality management must be enhanced during design, implementation and maintenance of the road construction projects.

Thirdly, Project planning compacts with project timely management that has the following instruments in the following procedure; determining project statement, creation of work

breakdown structure, then break each package to tasks, identifying resource availability, identifying total time needed, determining dependences of Tasks, identifying all milestones, establishing project measuring flow chart and building a project timeline management. The project timeline management can be achieved through the following steps; Clear actions; Order; Estimate activity resources; Plan schedule management and Estimate activity durations; Develop timetable and Control timetable as explained in the Project Management Body of Knowledge (PMBOK® Guide) – Fifth Edition. If the project timelines Management is not well defined in all activities then there is delay in project completion that's affects sustainability of the road construction project. To enhance sustainability of the road construction projects, project timelines management must be analytically followed as per the allocation timelines of the projects.

Fourth, Project planning pacts with project deliverables management. In project planning, a deliverable is given to clients either as goods or services. It usually has an expiry date, is measurable, tangible and precise. A deliverable is always given to a client either externally or internally to fulfill a milestone or expiry date that is designed and produced in the project plan. in road construction projects, a deliverable is the end road product, the road design document, the benefits, the goals, road objectives or any asset essential for road construction deliverables planning. Poor project deliverables management result to pitiable projects that are unsustainable as the intended goals and benefits of the road construction projects are not achievable. To safeguard sustainability on deliverables, the project deliverables management must be (SMART), Specific, Measurable, Achievable, Realistic and timely as illustrated by (Kermit Burley, 2013) in his book Deliverables in Project planning Management.

Fifth, Project planning concords with project evaluation management. Project Evaluation management from a “program evaluation” viewpoint focusses on periodic and objective formal assessment of the continued relevance and effectiveness of existing programs. Project evaluation in the road sector deals with monitoring of relevance, effectiveness, efficiency and impact and sustainability of road construction projects. Moreover, Project evaluation management also deals with auditing of road construction projects to heighten sustainability by carrying out performance audits, quality audits and operational audits. Sustainability of road construction projects cannot be achieved without proper evaluation of the projects during design, implementation and

maintenance period. Therefore, unsustainable road construction projects in Kenya is as an effect of poor evaluation techniques of project evaluation management. Therefore, to guarantee sustainability of road construction projects, Project evaluation management must be exercised in conformity to the suggestion of (Wargo M.J, 1983) in his book new directions of program evaluation.

In Kenya, the need for sustainable road development is increasing thus careful planning road practices is needed to be developed. It is essential to balance the pillars of sustainability as argued by (Davies, A, 2001) on balancing planning, public participation, environmental values and sustainability. The balance pillars on sustainability of road construction projects are the key elements of project planning that include; Project quality management, Project Cost Management Project Deliverables Management, Project Timeline Management and project evaluation. Around the world project planners are starting to discern the importance of developing sustainable road infrastructure for transporting good. Project planning chip in to develop blueprints and systems for rating sustainability in the process of quantifying aspects of road construction, practices and designs that are sustainable. The thirst for developing on sustainability of road construction projects and keeping up with the developing need of the people of Kenya to produce sustainable road outcomes, and, to understand sustainability qualifications and the needs of the clients seeking designs and road constructions projects that are sustainable as detailed in (PMBOK, 1996) a book for Project Management Body of Knowledge, as the total assembly of processes, great practices, terminologies, and rules that are recognized as standards within the project planning management industry.

Road sector in Kenya is in an aggravating state. Most roads that have been carried in the past out are not sustainable and are dilapidating in a huge way. Thus, most roads have huge potholes and unsuitable for smooth transport and therefore they are unsafe resulting to many accidents. Additionally, most roads must be maintained shortly or even before completion. The cost of maintenance of these unsustainable roads is high thus rendering slow economic development. Although, only project planning, in road projects, can be the basis to ensure sustainability, my proposal of use of the project planning allows me to comprehend knowledge or criteria sustainability covering vast variation in topics that range from the likelihood of constructing and maintaining of road construction projects and ensuring only sustainable roads are built.

Sustainability of road construction project is solemnly dependent on the flexible strategies of project planning as demonstrated by (Vennstrom. Anders, 2012) in his book titled; flexible strategies for long term sustainability.

According to (Wandenberg. J.C, august 2005) proposes a requisite requirement of project planning among the key requirement for sustainability in projects by ensuing the procedural steps that requires documentation of the project to facilitate a successful sustainability. All the activities involved in the planning are defined, prepared integrated, and coordinated with extra plans. The project planning documents show the project if carried out, supervised, regulated and completed. Thus, it needs high scrutiny in the activities such Project Cost Management, Project quality management, project Timeline Management, Project Deliverables Management, and project evaluation Management to enhance sustainability of road construction projects. All the activities in a project are interlinked to another thus it's the most critical path of Sustainable project life cycle

On global perspective, the life cycle project planning method considering the requirement of the stakeholders is a critical aspect in the milestone of achieving sustainability in the road construction projects. The variable of the research is perceived to measure the units' range, qualitatively or quantitatively, having the construction already assigned the variables, the emphasis and an applicable comparison of scores resulted from calculating the quantitative variables and qualitative variables utilizing the utility method. These score card variables are later compared to determine the most applicable sustainable approach to the construction of road construction projects. The project planning approach describes its flexible solutions only to sustainability of road construction projects and can be utilized together with other methodologies and have the capability of it being developed to a modeling apparatus based on the computer applications to achieve value in sustainability as described by (Fleming Quentin, 2005) in his book; earned value in project management.

Road construction projects also implicate on the various pillars of a country such as social, economy and environment both in largely and long-termly to maintaining its national sustainability. Through the project planning process and execution, it is essential to integrate with other resource and meeting up the stakeholders at different project levels like the architects and civil engineers, technicians, managers of the projects, and other engineers to assist in

attaining project outcome contributing to sustainability. This Research has tried to identify the essential aspects contributing to sustainable projects in planning construction projects of the road networks. Projects planning from both the public and private industry's experts, is integrated through clear agreements from both parties to facilitate successful project planning of the projects involved in road construction by following project planning procedures in relevance to the handbook of project management procedures by (Albert Hamilton, 2004)

Road construction projects through clear planning facilitate both social and environmental friendly construction approached to facilitate faster and effective transportation of resources and raw materials for economic growth. Other studies research have identified important facets for sustainable project planning in the construction industry such as: the aspects of the assessment of social factors, linking them to environmental and requirement of the economy to facilitate the contactors including shareholders to get more informed on sustainability issues implicating on road construction development projects by engaging professionals in road construction projects as a requirement from (Edum-Fotwe & Price, 2009) as explained in his book; the role of sustainability advisors in developing sustainability. This sustainability advisors will carry out project planning to ensure sustainability of road construction projects in utilizing the vision mission, utilization of human and natural resources, functions and the products as well as by-products to get to the core of project planning variables of Project Cost Management, Project quality management, project Timeline Management, Project Deliverables Management, and project evaluation Management of sustainability in the road construction projects and development sector addressing their barricades, alongside the challenges concerning sustainability in construction in pursuance to the recommendations of (Srivastava & Berger, 2010).

1.1.1 Profile of China WuYi Co; Limited

It is a construction and engineering company carrying out its operations internationally and an international branch of Fujian Construction Engineering Group Company. In 2012, it reported a return of \$334 million on international projects, ranking the organization 250th largest on the world as stated in (Engineering News-Record) about international contractors. It had eighteen projects in Kenya in 2013 only. It is among the six Chinese construction companies in Kenya

thus raising the competition for local and international contractors. For instance, the modernization of Jomo Kenyatta International Airport phase 1 costing \$37.2 million that was funded by the consortium of Kenyan bankers and the World Bank. It has constructed a pavement road to Ethiopia passing through Moyale to Isiolo costing funds \$63.9 million, provided by the African Development Bank, this road has significant effect in Africa since it connects Northern Africa to South Africa. It also collaborated with other Chinese companies in the construction of Thika Superhighway by widening and providing service lanes to ease traffic jam in the industrialized parts of Kenya. It costed \$360 million funded by Export-Import bank of China to facilitate faster completion. It gained scholarly attention on construction and development and social-economic relation with between Kenya and China. A 2013 report from the government of Kenya and as clarified in the Kenyan business daily of 2017(www.businessdailyafrica.com), noted that China WuYi had eighteen (18) projects in Kenya. The company's operations in Kenya is among the six large Chinese construction companies in Kenya, competing in an extremely competitive market locally as well as European construction companies as described by (Cooke Jennifer, 2008), on his article of American, and Chinese engagement in Africa.

Among key projects Wu Yi was nominated, include; upgrading of the Jomo Kenyatta International Airport in September 2006. The project was \$37.2 million first phase of the \$1.23 billion, sponsored by a consortium of Kenyan banks and the World Bank. The company was likewise a contractor in flooring the initial phase of the road between the border of Kenya-Ethiopia town of Moyale and Isiolo, a northern Kenyan gateway city worth \$63.9 million, sponsored by the African Development Bank. Reuter's article detailing the project distinguished there was a pan-African meaning to the project as it later lay down tarmac on one of the final sections of the Cairo – Cape Town Highway as indicated on, (china radio international, august 19, 2013)

Other significant projects, include Thika superhighway, china WuYi was among numerous Chinese contractors that erected the project that involved expansion of present road with one lane on one side and two lanes on the other to 12 lanes total. The \$360 million project bankrolled by the Export-Import Bank of China was completed in 2012 on schedule. (Reuters, august 21, 2008)

China WuYi Co; Limited (CWY) has managed to offer employment both directly and indirectly to the Kenya citizens from all walks of life. The company has employed over 400 employees, who are attached in various functions likes sales and marketing, logistics and warehousing, accounts and stores, transport, human resource and production. The company has spread not only in the country but has also opened branches in East Africa countries like Uganda and Tanzania. It is because of its various achievements that the company has been able to expand its market to the Central and Southern Africa countries. On Administration, the company is headed by a chairman who is assisted by several directors including Marketing Director, Finance Director and an Operation Director as well as a Technical director concerned with the daily management of core strategic issues of the company. Project managers are the persons in charge of road construction projects. The project manager prepares the planning of the projects in conjunction with other team to ensure sustainable road constructions. We have middle level manager who supervise the functional operations and report to the Directors on the daily operation issues as explained in China Wuyi website, ([www. Chinawuyi.com](http://www.Chinawuyi.com))

This research is based on two major roads that China WuYi Co; Ltd won last year which started this year at Nairobi county. The roads are KES 16 Billion road projects from James Gichuru to Limuru and supervised by KeNHA and a corresponding project of KES 3 Billion, from James Gichuru to Nyali and supervised by KuRA. This research will concentrate on influence of project planning on sustainability of the two road projects at Nairobi county being undertaken by China WuYI Co; Limited.

1.2 Statement of the problem

There is an alarming record of accidents on Kenyan roads as several fatalities are reported daily. Dangerous accidents have taken lives, leaving many others with both minor and critical injuries and painful memories as well. About three thousand (3000) citizens of Kenya die every year due to road accidents as recorded by (www.statistics.gov.hk/wsc/CPS030-P2-S.pdf). Thus, Kenyan government starting with Michuki's rules as an encumberment measure to reduce the latter, the only hope left is to provide better sustainability of road construction projects and road networks that would address issues contributing to the deterioration. Traffic rules effective from February 2004 made it mandatory for every public taxis and buses to fit speed governors, put safety belts for passengers, public service vehicles to function in clearly well-defined routes, PSV to

transport a specified number of passengers and discipline among drivers and conductors and lastly squeaky clean security record.

But what really causes road accidents in Kenya? Poor safety regulations in Kenya are to blame for the many daily accidents that occur as there are so many people who use road transport every day. However, some roads are not that good for use. Some have giant potholes. Bad roads in Kenya are often found in the rural areas where they are not considered to be as important as they are. There are so many negative effects that are caused by the terrible conditions of these roads as analyzed by (MB Ratemo, 2015) on analysis of causes and responses of road accidents in Kenya.

Pathetic Road network; Poor designs; Corruption; Overloading; Speeding; Poorly marked Bumps Inexperienced contractors; Poor planning; Poor specifications; Lack of Timely maintenance of road Poor road policy; Weak quality control integrated system; project delays; Lack of budget; Lengthy land acquisition; Lack of community participation in the planning process; Environmental issues; Inadequate monitoring; evaluation and auditing are the major contributors of the road accidents as investigated by (OC Daniel, 2016) on his article; exploring major causes of road accidents in Kenya.

Road construction infrastructure is key to economic growth. It helps to reduce and eradicate poverty in nations through the enhancement of competition, facilitates trade and integration of international community. As infrastructure reaches to business regions and accommodate investment, each access to products and services as well as employing more people. It contributes to economic sustainability, growth and development raising revenue for the government and national development. Therefore the issue of lack of sustainability of road construction projects in Kenya should be addressed through outlining the project planning management techniques of Project Cost Management, Project quality management, project Timeline Management, Project Deliverables Management, and project evaluation management that ensure long-term sustainability on road construction projects in Kenya and would reduce accidents drastically as required on effective project planning management that augments sustainability as explained by (Winston W. Royce, 2013)

(Mc Graw-Hill,2006), hinted out that lack of project planning in projects consequences to long term effects of unsustainability in his book of evolution of project planning management. Therefore, poor project planning impacts negatively the sustainability of any project. Thus, it's crucial to carry out effective project planning management to ensure long term sustainability of road construction projects. Consequently, the issues raised above are part of the big problem that results to unsustainability of road construction projects and road networks in Kenya as expounded by Clay Muganda in an article at ([www. Standardmedia.co.ke](http://www.Standardmedia.co.ke) dated September 28, 2014). Through integrated project planning the researcher explored the problems and proposed integrated project planning system to be complied to ensure sustainability of road construction projects in Kenya.

1.3 Objectives of study

1.3.1: General objective

To establish the influence of project planning on sustainability of construction projects in Nairobi City County in Kenya. A case of China WuYi Co; Limited.

1.3.2: Specific objectives

- (i) To find out how project cost management contributes to sustainability of road construction projects.
- (ii) To examine the effect of project quality management on sustainability of road construction projects.
- (iii) To determine the effects of project timelines management on sustainability of road construction projects.
- (iv) To identify how road project deliverables management affects sustainability of road construction projects.
- (v) To investigate how project evaluation Management affects sustainability of road construction projects.

1.4 Research questions

The study sought to answer the following research questions;

- (i) What is role of project cost management on sustainability of road construction projects?

- (ii) What effect has project quality management partakes on sustainability of road construction projects?
- (iii) To what extent does the set project timelines management affect sustainability of road construction projects?
- (iv) What are the contribution of project deliverables management on sustainability of road construction projects?
- (v) How the project evaluation management affect sustainability of road construction projects?

1.5 Justification of Significance of the study

China WuYi Co; Limited will gain from study as the top management become more informed about the role of project planning on sustainability of road construction projects. The study recommendation will be implemented where necessary in a bid to improve the construction of sustainable road projects. The study on influence of project planning on sustainability of road construction projects is a learning paradigm to the contractors, designers and all stakeholders of the road construction industry and institutions of higher learning. This study will impact wide benefits to the road users and maintain sustainability on our road construction projects.

Future researchers will find this study beneficial and might therefore use its findings as a benchmark to other researches they might carry out in the future. In other words, it will be used as reference point on the use of project planning on sustainability of road projects. As with the case of China WuYi Co; limited, other companies would take into consideration the study finding by adopting and implementing some of the recommended strategies of boosting project planning in constructing sustainable road projects.

1.5.1 Project Beneficiaries

There are many beneficiaries of project planning on sustainability of road construction projects; some of them are stakeholders, road users, the Government, the community, the financiers, the contractor, the supervising consultants, the road designers and other support sectors. These beneficiaries reap huge outcomes of the part played by use project planning in constructing sustainable road projects in speeding the economic growth of the nation.

1.5.2 The Researcher

The study has provided information and knowledge on influence of project planning on sustainability of road construction projects. The study has also provided an opportunity for the researcher to enhance his analytical, evaluative skills in project planning.

1.6 The Scope of the study

The study was based at the China WuYi Co; Limited and involved Human resource, project manager office, Accounts and stores, engineering, procurement, material laboratory, workshop, supervisors, managers, surveyors, Administration, Production, equipment and machines section, quality control office, safety office, liaison and community/ public relation officers, environmentalist, Sales and Marketing function with a total population of 324 employees. The study was carried out at the China WuYi Co; Limited. The study confined itself only to the influence of project planning on sustainability of road construction projects. The application of the data of data collected by the researcher was limited to the sample population taken at this Chinese Contractor since there are many other constructing companies at the Nairobi city county in Kenya. This study was undertaken in the period between the month of January and March 2017.

1.7 Limitation of the study

The China Wuyi Top management level was reluctant to giving information relating to the company. Also, the other staffs had had the fear of disclosing information relating to the sustainability of road construction projects. Another Limitation was the Senior Chinese staff didn't disclose fully all the elements in project planning that they were using in building sustainable road project which is lack of effective technology and project planning skills transfer to the local staff. The nature of the Topic is greatly feared by many people. This is because not many would want to give their views concerning the sustainability of the road projects. Not many respondents would be fully open to how project planning skills influence sustainability of road projects. This gave the researcher complex constraints in disseminating the facts because of generalization. The researcher suspected that the contractor was not using project planning elements on sustainability of road construction projects. The researcher requested the senior staff not to fill any names on the questionnaire and the researcher explained to the Chinese staff that

the data collection was only being used in the research study and hence they agreed to provide the information after earlier refusal.

The reluctance to respond to questionnaires was the most key limitation in collecting the required data. This was due to some reservations held by the staff. Lack of enough respondent which lead low respondents rate with little time to attend other matters during working period. This posed a challenge in getting targeted respondent to fill the questionnaire. This led to generalization made from those who responded to represent the views of the rest of the respondents. The Researcher did leave the questionnaires at china WuYi office for a period of two weeks in which the required information was filled by the required percentage of respondents that was required by the researcher

Another limitation was communication barrier. Most management staffs who are Chinese didn't understand English. English translators to Chinese language was used to convey the message from the researcher to the Chinese staff.

Employees were reluctant to provide or disclose some of the information asked for by the researcher for fear of victimization. The researcher dealt with this challenge by giving an assurance to the respondents that the information given was to be strictly used for the research purpose only.

1.8 Summary

This chapter comprised introduction, background of the study, as well as the statement of the study to establish the gap in the literature. It developed the objectives from general to specific which then formed the basis of the research questions. It also discussed the justification and scope of the study. The general objective of the project is to establish the influence of project planning on sustainability of road construction projects in Nairobi City County in Kenya. The specific objective of the project is scaling down to the specific aspects that constitute the general objectives such as project cost management, project quality management, project timeliness management, project deliverables management, and project evaluation management. There are also project limitations such as availability of respondent, communication barrier, and fearing victimization.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Under this chapter, the variables under measure are reviewed as per what other researchers had investigated; empirical literature, as well as what professionals have written on these variables; theoretical review. All this was captured under past studies which were followed by a critical review where gaps to be filled or connection of the past studies with the current study features. A summary of the chapter concludes.

2.2 Review of Theoretical Literature

2.2.1 Project planning management

Project planning refers to a practical step employed in project management through which necessary documentation is generated in ensuring fruitful project end. Documentation involves the overall action necessary in defining, preparing, integrating and coordinating additional plans as indicated by (Comminos & Frigenti, 2002) in the practice of project planning management. Project cost management, project quality management, project timelines Management, project deliverables management and project evaluation management are defined by the project planning. Project planning necessitates a comprehensive analysis as well as structuring in the subsequent events to ensure sustainability of road construction projects as argued in in a guide of Project Management Institute (2000).

(Joseph Phillips 2003) in his book of Project Management Professional(PMP) Study Guide, defines modern project planning management as the knowledge and understanding of the project planning elements of Project cost management, project quality management, project timelines Management, project deliverables management and project evaluation management as processes vital when planning management on sustainability of road construction projects. This stage of project planning demands several inputs such as conceptual proposals, schedules for the project, resource necessities/ restrictions and achievement metrics.

Project planning starts by project scope setting and ultimately operating through every stage of dependent actions, responsibilities, checkpoints and limits as regarded by (Comninou & Frigenti, 2002). Whole of this data is assimilated into Gantt charts or other scheduling chart kinds to deliver a project synopsis to the parties involved. Project planning is plays a critical part on sustainability of any road construction projects as it sets the criteria, requirements, goals and benefits to be accomplished during design, implementation and after completion of projects as implied by (Martin Stevens, 2002) in his book; Project Management Pathways.

Eddie Obeng, (2003) on perfect projects, described project planning administration as the discipline that plans, organizes and manages resources with the aim of bringing about a fruitful end of explicit project goals and objectives, he further notes that no perfect project can be achieved on sustainability if the project planning techniques are not applied from the onset of the project. According to Albert Hamilton (2004) at his book entitled; Handbook of Project Management Procedures illustrates how Project planning management procedures plays an important role in ensuring successful end of sustainability of large projects.

Project planning is regularly employed to unify diverse areas of a project, for instance, project plans, workloads and the organization of teams and people as termed by (Dennis Lock, 2007). The rational dependencies amidst tasks is defined via an activity network illustration that allows identification of the critical route for sustainability of the project. Project planning is fundamentally uncertain and because of this, it must be done before the project begins and not when the project is in progress to ensure sustainability of construction projects. Consequently the duration of the errands is every so often assessed through a weighted average of positive, normal, and negative cases for the planned project through project planning management technique of project timely management as explicated by (David I. Cleland & Roland Gareis, 2006).

The critical chain technique enhances "buffers" in the planning to foresee likely postponements in project execution. Slack in the calendar can be calculated through project management software. Required resources can be projected and costs for separate activity assigned to each resource, giving the sum project cost. During this phase, the project schedule may well be enhanced to attain the suitable equilibrium between resource use and project length to conform to the project objectives. As soon as it's established and approved, the project schedule grows into baseline schedule. Progress is measured in contrast to the baseline schedule all through the life of

the project. Evaluating progress comparison to the baseline schedule is identified as earned value management (Fleming Quentin, 2005).

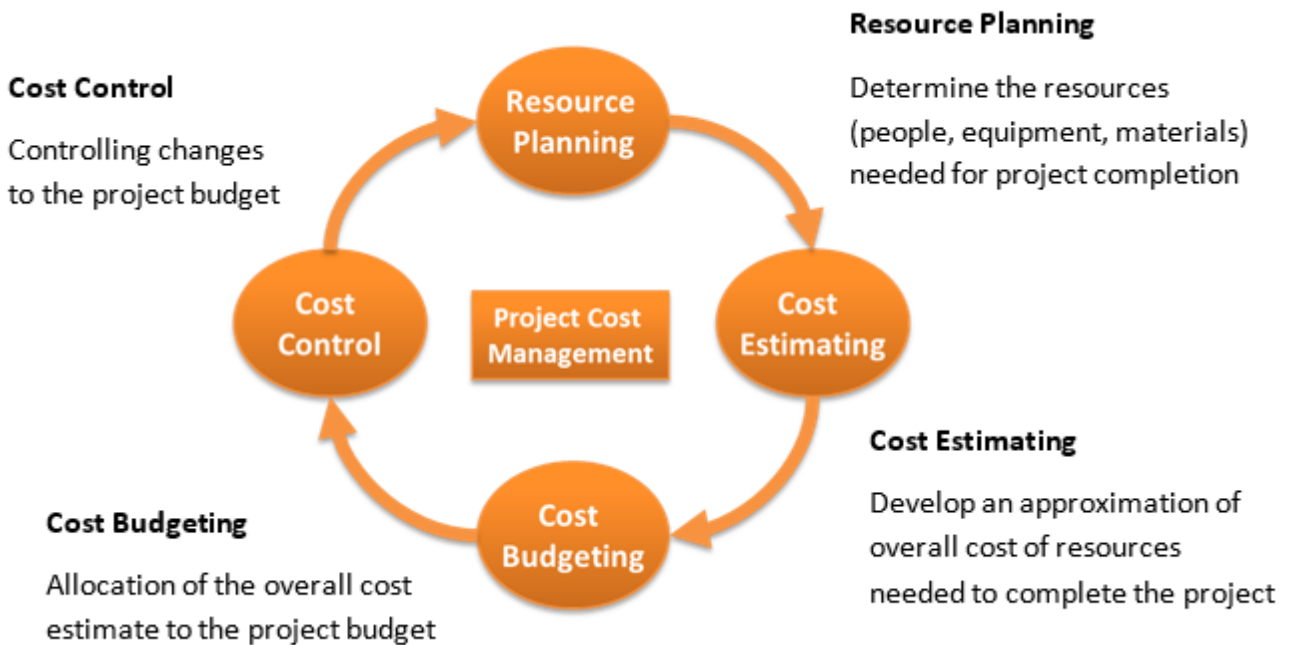
An important document is the project plan in the project, realized through project planning, because it provides a roadmap to the project managers and on the track views. Additionally, it provides on set phases, tasks and phases needed for effective project deliveries management. In the project planning management is the timeframes, the resources and milestones for the completion of the project to boost sustainability. A project plan template is also involved in project planning. This enables creation of an all-inclusive plan for project planning management simply because it gives the lists of tasks and procedures to be followed on sustainability of the road construction projects from the beginning to the end (Harold Kerzner, 2003).

2.2.2 Project Cost management on Sustainability of Road Construction Projects

Cost plays a major role as a KPI (Key Performance Indicator) in project management. Processes positioned around plans, estimations, budgets, finance, funds as well as management of cost control are convoluted in monitoring costs so as to complete the project with the agreed budget. Project Cost management looks how procedures are applied in monitoring the expenses and enactment beside projects progress or operations involving manufacturing, measuring variance from accredited budgets as well as allowing real action to be employed in achieving minimum costs (PMP. Augsburg, 2012).

Project cost management (PCM) is among significant facets of project planning management that needs to be grasped. It comprises activities and tools that assists in completion of projects within the stated budget. PCM includes numerous precise roles of project planning management including appraising, job and work controls, field data collection, programming, accounting and design. PCM key goal is to finalize a project within accepted budget starting with estimation, a vital tool in PCM, real historical data is used to correctly plan every facet of the project. As the project progresses, job control uses data from the estimate with the information stated from the field to measure the cost and production in the project. Since project commencement to completion, project cost management has an objective to streamline and lower the project experience as charted in the Guide to the Project Management Body of Knowledge, (PMBOK). Project Cost management involves the steps in the figure below.

Figure 2.1: Project Cost management on Sustainability of Road Construction Projects.



(Author; Cost Engineering Consultancy, 2017)

Having cost management in mind when starting a project makes it possible to avoiding assured pitfall. Cost overruns are likely to happen in case the projects expectations were not clearly specified or were changed during the project implementation. Underestimation of costs may happen if the costs were not fully researched providing a false indication about the success of sustainability of road construction projects (Kathy Schwalbe, 2014).

Cost control Involves investigating on the procedures applied in detecting difference of actual costs from planned expenses, analytical procedures in establishing the variance cause and counteractive measures to upshot readjustment amid actual and budgeted expenses. Therefore, cost control refers to the processes by which business expenses are identified and reduced to augment profits. Cost control is a phase of the project cost management process where the assigned budget is revised and expenditure is tracked. The project manager is accountable for control of expenditure and guarantees the budget distribution is optimized and costs completely

covered within planned and assigned budget. This process starts with the processes of costing. The owners of businesses equate actual outcomes to the planned prospects and then if actual expenses are higher than anticipated, the administration acts. On the other hand, cost variance refers to the difference amid planned and actual outcomes, and managers employ variance analysis in identifying the grave areas requiring change. Every month, an organization is required to execute variance analysis on every revenue as well as expenditures account. Thus, Cost control is based on submission of procedures to check expenditures and performance contrary to progress of road construction projects or manufacturing operations; to measure variance from sanctioned budgets and permit effective action to be taken to accomplish least costs. Tight cost control gives a company substantial impact over its cash flows and profits and helps to attain sustainability of projects (PMP, Augsburg, 2012).

Cost budgeting, in a project, is the anticipated expenditure as identified by the budget. It provides a baseline by which the real expenditure and the foreseen ultimate cost of the task is provided. Therefore, cost budgeting is referred to as “amassing the projected costs of individual’s actions or task packages in establishing a cost baseline” (comp. PMBOK3). A cost budget can be termed as a strategy about your organization’s acknowledged expenditures for the next period.

Budgets can be made for various expenses like project expenditures or product improvement expenses. Initial expenses assessments can either be comparative or parametric. They are distinguished as the likelihood and appeal of the initiative are examined and a better scope understanding, agenda and resources is established. Once approved, the polished approximations make the standard fee (comp. PMBOK3). Allocating costs to actions in a plan, an expenditures profile is created to ensure sustainability of projects. The government, organizations and individuals uses budget variance as a periodic measure in quantifying the dissimilarities amid budgeted and real figures for specific bookkeeping category. Affirmative variances or advances are referred to as auspicious budget, the adverse budget adjustment is described by the unfavorable budget variance.

The inability of predicting future with comprehensive correctness may occur when forecasters are faced with budget variances. Budget variance is caused mainly by errors, varying business circumstances, and unfulfilled expectations. Errors can be caused by budget creators when compiling the budget. It happens because there might exist faulty math, assumptions might be

wrong and can be caused by unreliable data. Varying conditions for businesses may happen because of changes of the overall economy, changes in the costs of raw materials or new competitors (comp. PMBOK3). Politics and regulations by the government if not accurately forecasted can also be included. Included in the budgeting cost is cost approximation, setting a static budget and running and monitoring the definite costs.

(James P. Lewis 2000) refers Cost estimation, as an estimation of a programs/operation/project cost. Cost estimates has a distinct overall value and might have distinguishable constituent values. The professor preparing cost estimates is referred to as the cost estimator. Estimations can be obtained from in-house costs or external costs taken from past experiences of comparable projects Faced with difficulties in pinning down cost estimates, three-point estimations of optimistic, pessimistic and at times allowing statistical analysis of the general project price. Cost estimation refers to the art of allocating value. In other terms, it can be referred to as a science that utilizes a varied technique in predicting activities and assets cost. Wide ranging methods, applications and estimating names are in existence. Cost estimation is useful in predicting quantity, cost as well as prices of the resources presented by the projects scope. More so, is useful in providing the decision developers with the means of making decisions for savings, choosing amid alternatives and in setting up budgets during the front end of projects as emphasized by (O'Sullivan, Arthur & Sheffrin, Steven M., 2003).

Estimation is made possible by breaking down a projects total scope into convenient parts thus enabling resources assigning and costing. Work Breakdown Structure (WBS) as well as Cost Breakdown Structure (CBS) are identical ways employed in breaking down a project Cost estimation. It also uses a comprehensive Basis of Estimate (BOE). This basically refers to a report describing the expectations, insertions, omissions, correctness as well as other aspects required in interpreting the overall cost of a project to maintain sustainability of projects. It is vital in communicating the estimate to the varied parties playing part in the making decision and is handy when closing out when comparing the project with others as described by (M7orgen Witzel, 2003).

Resource planning, refers to a business management software commonly referred to as Enterprise Resource Planning (ERP). Manufacturing resource planning (MRP and MRPII), is a technique for management of resources related to manufacturing organizations Distribution

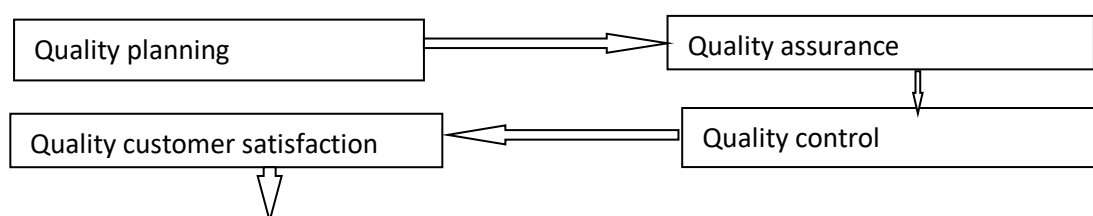
Resource Planning(DRP) is a technique used for order planning employed in supply chain. Project Resource Management Plan is important in identifying the overall resources needed for completing a project successfully. By exploiting the resource plan vehemently an individual can identify the labor quantity, resources as well as equipment required in delivering the needed project. Resource Plan provides a summary of the resources level required in completing a project and influencing sustainability of projects. More so, if accurately documented, it stipulates the exact labor quantity, resources and equipment necessary for project completion. Additionally, it helps in getting the approval from sponsors. With better practices, it assists in budgeting and forecasting the expenditure of the project and it enhances sustainability of projects (David I. Cleland & Roland Gareis, 2006).

2.2.3 Project quality management on sustainability of road construction projects

Quality management refers to the process that ensures that all project tasks essential in designing, planning and implementing a project are operative and resourceful in respect to objectives purpose as well as its performance as acknowledged by (Kaoru Ishikawa, 1985) on total quality management. It refers to the overall processes and actions required in determining and achieving project quality.

In its very basic level, the term quality is used to means reaching the customer's needs. Quality management involves four necessary components. These includes Quality Planning, quality assurance, quality control as well as constant upgrading (Joseph M. Juran, 1998). Tools are included as well as techniques and procedures in ensuring that the results and profits meet client's requirements. Project Quality Management (PQM) is therefore a process that certifies that project activities required to design, plan and implement a project are effective and efficient (John Wiley, 1997).

Figure 2.2: Project quality management on sustainability of road construction projects.



(Author; Goetsch D.L & SB. Davis, 2001)

Project quality management (PQM) refers to a knowledge area of project administration that is concerned with the project quality. The area attends to the product resulting from the project as well as the then inclusive of project planning management. Sustainability of projects main goal is identifying, assessing, controlling and achieving quality of products by use of detailed processes and activities. Also, it provides the knowledge that address how to identify, verify, and control of quality in any project as pinpointed above on figure 2.2, by (Louis E. Schultz, 1994).

Quality planning is first the component, of project quality management. This encompasses preparation of a quality management plan that explains the processes and metrics to be used. Project quality management plan requires pact with significant stakeholders to guarantee expectations for quality is appropriately acknowledged and sustainability of project wholly attained (Lohr KN & Schroeder SA, 1990). The processes defined in quality management plan must follow the processes, values and culture of the host organization. It is the area involved in preparing quality management plan describing the processes and metrics that would be employed. Plans employed in quality management necessitates an agreement with the appropriate shareholders in ensuring that the parties' quality expectations are acknowledged appropriately. The quality management plan processes must be in line with the organizations culture, values and the processes of the entire institution (Thareja P, 2008).

(Gryna F, 1993) explains Quality assurance, as a technique that avert mistakes or shortcomings in manufactured products or construction of projects and evading hitches when providing results to project deliverables management or providing services to customers. This provides confidence within the hosting institution by ensuring that its projects, selections and plans are being managed appropriately to enhance sustainability. It gives the validation associates with following procedures as well as standards by ensuring the workforce is in possession of suitable skills and knowhow as well as assertiveness necessary for fulfilling their accountabilities and roles in the

project in a proficient custom Quality assurance does not depend on program, portfolio or the project to which it is applied (Feldman Stuart, 2005).

Quality assurance offers self-assurance to the host organization that its projects, programs and portfolios are properly managed. It corroborates the steady use of procedures and standards, and guarantees that staff have the right knowledge, skills and attitudes to meet their project obligations. Quality assurance must separate from the project, program or portfolio to which it sorts to improve quality on sustainability of projects, (Pyzdek. T, 2003)

(Deming W. Edwards, 1939), describes quality control as a process where entities assess the value of all factors of production involved. It entails inspecting, testing and measuring. It provides the verification that deliverables are conforming to requirement, are purpose fit as well as they meet the shareholder's requirements. It determines whether the accepted standards have been achieved or not. For the quality control to be effective, quality control stipulations must be put under stringent conformation control as emphasized by (Wagner Stefan & Meisinger Michael 2006). Normally, cost control happens to allow changes request accommodation as well as upholding the tolerable time and cost restrictions. Changes made should be permitted and conversed. Quality control, comprises of process of scrutiny, trial and measurement. It authenticates that the deliverables adhere to specification, are appropriate for purpose and are in conformity to stakeholder expectations. Quality control activities regulate reception whether acceptable or not. To be effective, provisions ought to be under stringent configuration control. It is likely that, if approved, the specification could necessitate alteration. Usually this is to accept change requests whilst upholding reasonable time and cost constraints. Somewhat consequent variations to acceptance criteria should be accepted and communicated to advance on sustainability of projects or products (Feigenbaum, Armand V. , 1956).

(Juran Joseph M., ed. (1995), illuminates Quality Customer Satisfaction as a measuring of quality of a project, where customer satisfaction is a key component. Project Quality management is apprehensive of outcomes and administration of the project. When the products of a product do not meet their expectations, they might consider it as poor, irrespective of what the teams or the project manager thinks. Hence, it's paramount for the team and the project manager to guarantee that the client's requirements are achieved. For a project to succeed, it is

necessary to uphold customer satisfaction. Quality therefore is an ingredient necessary in meeting client's purpose as well as work on building sustainability of projects or products (Dale B, 1994).

(Imai Masaaki, 1986) defines constant upgrading or kaizen as adjustment for better. Kaizen is a Japanese word for "continual improvement". In business, kaizen refers to actions that endlessly improve every function to increase quality sustainability. The last component, of incessant upgrading, is a generic term employed by organizations to describe how data specified by quality assurance and quality control processes is used to advocate for improvements in efficiency and effectiveness. Continuous maturity model offers a framework with which constant improvements can be introduced and rooted in the organization to sustain sustainability of projects, (Maurer, Robert 2012).

This generic phrase is used in institutions to describe in what manner information delivered by quality assertion and quality control procedures are employed to drive developments in competence and efficacy quality is essential in providing a cutting competitive edge. Satisfying clients is key to all actions related to project quality management on sustainability of projects or products. Clients have the expectation of receiving high quality standards. In other hand, the service quality is a counter factor. Reacting faster, providing reliable information and employing effective counteractive procedures comfort clients and is the best way to increase continual improvement and sustain sustainability (Hamel Mark, 2010).

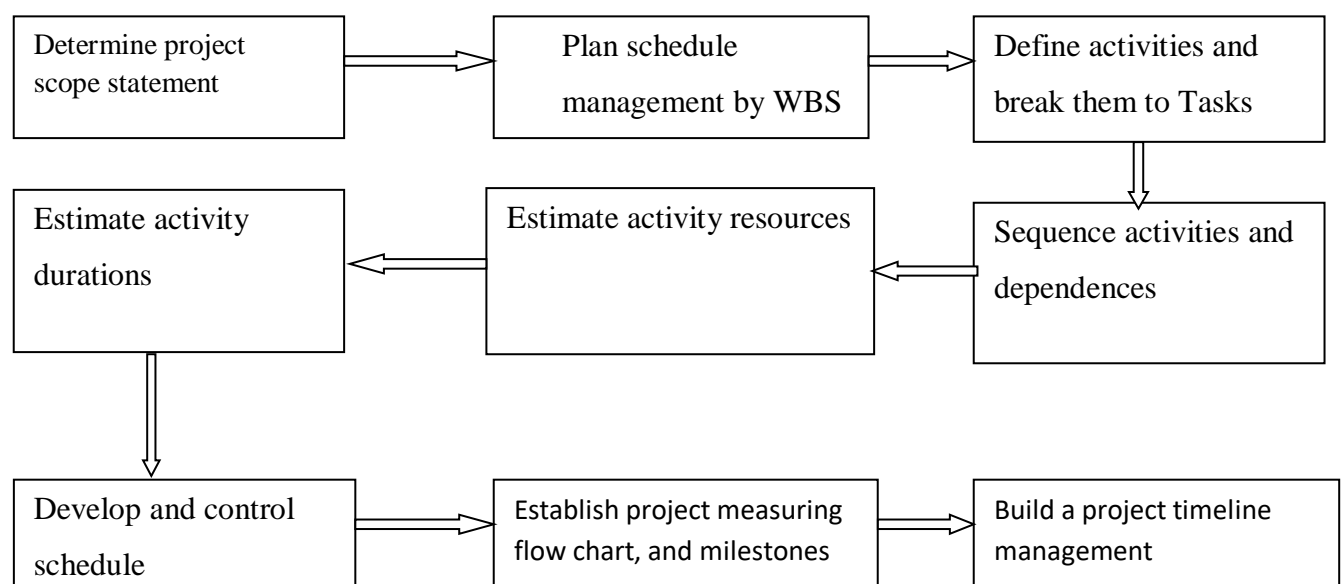
2.2.4 Project Timelines management on sustainability of construction projects.

Project timely management(PTM) is the process of planning and exercising mindful control on time consumed on precise activities particularly to increase effectiveness, efficiency or productivity (Lakein Alan, 1973). In every project, the timeline for the project is the beating heart. It appropriates the core of what would be accomplished by the project and the possibility of maintaining sustainability of the project. Ability to generate a project timeline in early times of a career is an important skill required by the project managers (Carayannis, Kwak & Anbari, 2005). With effective and efficient project management timeline, scheduling activities and visualization of the necessary procedures to complete project becomes easy. Through this, the

timeline managers can be informed of the delays in their projects therefore acting accordingly to enable them plan effectively and contain sustainability (Morgenstern, Julie, 2004).

Project plans are incomplete in absence of timeline for project management. The timelines deliver a modest visual impression of the intended project from its start to end thus augmenting task proficiency amid teams. To novice managers, breakdown of a project into an actual timeline might become irresistible (Carayannis Kwak & Anbari, 2005).

Figure 2.3: Project Timelines management on sustainability of road construction projects.



(Author; Carayannis, Kwak & Anbari, 2005).

The process that determines the project scope statement of a project frameworks where deliverables and individuals are planning to predict when the project start and ends is known as writing the scope statement for the project. A detached blog post is necessary when writing the details of an effective scope statement thus at that point, the team assumes they have made it in pursuance to (Carayannis, Kwak & Anbari 2005). The final results are vivid and therefore can be articulated with clarity when the project is completed to sustain sustainability of projects as argued by (Patrick Forsyth, 2013).

Plan Schedule Management Process; refers to establishment of policies, procedures and documentation mandatory in management of project schedule from the beginning of the plan,

continuing development, execution and then control of schedule. The output of planning is production of a schedule management plan. Nevertheless, in actual life probably there is no detached plan to manage schedule. Much of work ends up in project management plan for effective sustainability of projects (LeBoeuf Michael, 1979).

Defined activities process; recognizes and documents what is needed to yield the project's deliverables. The project tasks are identified and the project planners use the scope statement that are put together during the scope management activities to assist in the breakdown of work into separate tasks. The key output of working through defined activity process is that the project planning team ends up with a defined list of project tasks for long term sustainability which is useful as it's the main input to the best process of attaining sustainability (Richard Walsh, 2008).

Sequence Activities Process; is a task list that assists in putting activities in correct order. During conclusion of each timeline process project planning team usually view the relationships between project tasks. This process aids in putting project work in correct order thus making efficient use of the project's resources prompt as possible to maintain sustainability of projects. If planning team wishes to do network diagramming for some reason, then project planning management software is employed (Le Blanc, Raymond, 2008).

Estimate Activity Resources Process; this refers to approximation of the budget used by the activities. In this process, the planners work with human resources, project managers, technical team, equipment and supplies team and other stakeholders in maintaining value for project and sustaining sustainability of the project (Ivy Lee, 1877–1934)

Estimate Activity Durations Process; this involves calculating duration of each task. Through this process respective activity timelines are identified, using identified resources. Resource accessibility and holidays within the activity durations are similarly calculated. The total timelines is factored in all activities because of unforeseeable changes in the course of project implementation to guarantee sustainability of projects as directed by a fully diverse approach which argues against prioritizing altogether (Mark Forster, 2006).

Develop Schedule Process; this entails assembling the project schedule. From information collected from the above processes, developing the schedule is among complex processes in the

PMBOK® Guide. It also reflects risk, scope and elements linking to the project context to develop the schedule process. The schedule is only one among the outputs of the activities of the projects. This allows the project planner to plan successfully in contemplation of the schedule which is a critical document in managing sustainability of construction project's performance. Getting Things to be Done (GTD) was formed by (David Allen, 1992) the basic concept supporting this process is completion of all the minor tasks instantly while dividing bigger tasks into smaller tasks to start finishing in the schedule process. The idea is to evade information surplus or "brain freeze" expected when bombarded with hundreds of tasks. The drive of GTD is to motivate the worker to remove tasks and ideas out and on paper whilst ensuring organization is speedy as possible and manageable.

Control Schedule Process; provides the tools essential for monitoring and updating project schedule, ensures variations are managed properly and control of the timings of project. Formulating project schedule and tracing it later is time consuming but worth it since it helps build confidence in the schedule. Current task list applications are built-in task order that back several methods of sifting and ordering through control schedule process that allows sustainability of construction projects or products, and may allow one to associate arbitrarily long notes for each task as proposed by Charles M. Schwab (1939).

Identifying important milestones; (Sandberg Jared, 2004), argues that Tracking down a project progress from the start to finish is made possible by the milestones. By doing so, individuals lagging can know how far they are in advance of their final deadline therefore, being able to fine-tune their plans to stay on board. The first step involves creating the project in flow. Subsequently, project timeline management can be included to help in establishing a plan, timetables along with other projects and of course staying on course as described by (Lock, 2007). After creating a project in Flow, individuals can add timeline into it allowing them to view their projects together with other planned projects present on the Project Calendar enabling them to obtain involuntary reporting within the pane of the project on if their team is on time of lagging behind the schedule. Through a glance, completed and uncompleted tasks can be seen. At this stage, the available data together with the remaining time from the project timeline management permits Flow in determining if individuals are on time or behind the timetable thus

they can assign staffs accordingly or even twitch on planning about their next project by considering sustainability (Richard Walsh, 2008).

Building your project management timeline; Building an authentic precise project timeline that is quantifiable and accurate to perform effectively throughout the project. Timelines are necessary in allowing individuals to determine the completed tasks and the ones uncompleted to ensure all activities are completed within the projected timelines to ensure sustainability of construction projects as the project is completed within the set projected timelines. Additionally, it helps in knowing whether they are behind the schedule or not as projected by (Patrick Forsyth, 2013).

2.2.5 Project deliverables Management

Project deliverables Management (PDM) is tangible or intangible good or service process produced because of a project that is intended to be delivered to a customer (either internal or external). A deliverable is a report, document, software product, a server upgrade or any other building block of an overall project Goals; Project deliverables Management have goals and objectives. Goals try to explain where an organization is attempting to move to whereas the objectives are the measurable specific attempts. Each project has specific objectives which it is trying to achieve which supports the goals to be achieved providing measurable instances for tracking the progress of the projects. Completing the project based on sustainability is the main goal of project managers as it's their obligation to manage the project through project deliverables management. As the project managers if focusing on the completion of the project, other factors such as quality of the outcome and satisfaction of the customers are the propelling goals of the project. As there are objectives supporting the each of the goals, the triple constraints model should be considered as most certification and project management courses recognize them to ensure sustainability of construction projects as emphasized by (Kermit Burley, 2013).

(Cutting Thomas, 2009), deliverables rely on other deliverables that are finalized foremost; this is not unusual in project with several successful steps. This makes time savings possible, reducing significantly the entire project ultimate supply term. Deliverable varies from project milestone in that milestone measures progress close to output, while deliverable is the output distributed to a customer or sponsor. For a typical project, milestone could be the completion of a

product design, while the project deliverables management might be the technical diagram or detailed design report of the product or project that ensures sustainability (Bernie Roseke, 2015).

(Grant Anthony .M, 2012) defines goals are long term definition of what an organization is yet to achieve. Projects objective are not considered as essential for so long as the project manager comprehends the goals of the business and customer satisfaction which are the objectives of the business. The best practice considered is the ability to set the goals using methodologies such as Grant chart, Work Breakdown Structure, among others. Thus, the project deliverables management planners focus on goals to generate decisions in consideration of the specific objectives affecting each goal of sustainability. Goals and objectives that are unclear should be avoided as they can make the project processes to be chaotic which are difficult to control unlike when they are clearly structured and organized to enable sustainability of construction projects as (Emmons Robert. A, 1996).

Deliverables and activities; There are the tangible outcomes of an activity, that is, they are products of results that are unique and can be verified and unique that has to be there for the completion of the processes, project phases or the whole project for project deliverables management. A deliverable is an outcome or a result of an activity. The objectives are defined by either one or more deliverable thus the objectives should not be defined a deliverable or too specific because it can lead to the development of unprecedented project deliverables management that result to sustainability. Activities on the other hand are what forms up a process or a specific function during the project planning and development. The contribution of the activities sums up the achievement of the project objectives. The objectives have a role of defining the processes of the project (Creek Jennifer & Lougher Lesley, 2008).

The project manager and the clients must agree on the expectations at the end of the project. The objectives can easily be populated by the SMART mnemonic as highlighted (Sheldon Kennon. M & Kasser Tim, 1998) to build sustainability of construction projects through project deliverables management as follows; specific: definition of the objectives in a clear and detailed manner to exhausted chances of misinterpretation. Can be broken down to the Who, to perform What, When, Where and the reasons Why. Measurable: defining the instances of determination and specification of performance that are milestones to the objectives attainment of

sustainability. Achievable: identifying the reasonable objectives that can be attained successfully. Realistic: choosing objectives that are believed to be attainable by the team aligned to the goals. Time bound: having specific time allocation for the specific objectives.

Definition of project goals; the final goal of the project should be constituted by a specific strategy which might be the agreement with the client or the goal of the business in achieving a long-term goal. The project deliverables management and agreement should be unanimous to all the parties involved to curb the misunderstandings that might arise in the middle of the project. When it comes to planning phase, an agreement should be reached to approve the main method or techniques that are going to be applicable to the project to avoid delays or divergence. There are different types of goals such as: Specific goals are clear definitions of the what needs to be achieved and how they can be achieved to avoid the different interpretation of the same statements; measurable goals which are measurement of the achievements stating the numerical measurement, and the range of achievement by the end of specific period of time; attainable goals including each individual's or team's contribution based on their responsibilities, knowledge and skills; relevant goal comprising the motivational achievement of the milestones and objectives to the firm or to the team; and time based goals entailing the achievement by deadlines to be time conscious for the completion of sustainability of projects as researched by (Blake, Helen & Pinder David, 2009).

Identification of milestones; The identification of milestone is a measure for illustrating, scheduling, and evaluating the progress of projects from meetings, approving proposals, phases of the project to the project deliverables management that yield sustainability. The milestones are steps that can be acted on adding up to meeting the main goal of the project. Through the breaking down of the project into small actionable phases, it becomes easy to identify the shortcoming in the project phases determined by the timelines given. The milestones are supposed to be clear through scrutiny of the main goal of the project as provided by (Brunstein Joachim. C, 1993).

Vision statement; provides generalized expectations of the project often high-level achievement which are difficult to attain. It is a summary of the specific objective of the organization defining the goals of the organization. Objectives; They are low-level description which are measurable results contributing the achievement of the milestones thus influencing the goals of the project.

The specific tasks and project deliverables management of a project are the main descriptions of objectives. Project contributions are determined by the detailed statements which are the objectives while the aims of the sustainability of projects are defined by the goals, (Ryan Richard, 2000).

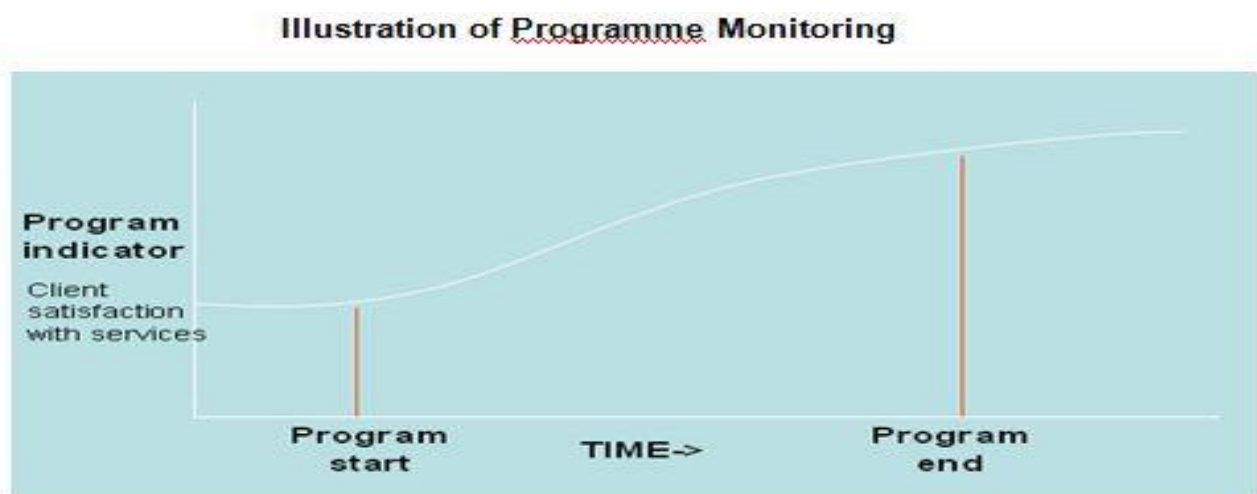
2.2.6 Project Evaluation Management

Project Evaluation Management (PEM) is continuous and systemic following up of results produces by the processed input. The outcomes of these procedures are measured and feedback generation upon satisfactory implementation of procedures assisting to regulation of gaps based on the objectives to attain long term sustainability of projects. Evaluation is the induction of assessment of the effects and results of the projects, policies and programs against, effectiveness, efficiency and economic conditions based in the equity and environment. Evaluation is an orderly resolve of a subject's excellence, value and implication, by means of criteria administrated by established standards. It helps aid an organization, program, project and further initiative to evaluate realizable concepts or a little alternative, to aid in decision-making; or to establish the degree of accomplishment or value regarding the intention and objectives and results of action that has been completed. The key drive of project evaluation management, in relation to gaining understanding into prevailing initiatives, is to allow reproduction and assistance in identification of impending change to create continuous sustainability. Lastly, audits of performance are projected to be an independent guarantee induction to provide guarantee on the programs, projects, tasks and functions based on the effectiveness, efficiency and economic conditions across the reference of the environmental conditions and impartiality. The purpose of audit of performance is to provide remedies to what, where and how can be improved to produce better outcomes (Datta, 2006).

(Thomson and Hoffman in 2003), explains Monitoring as a logic process for collection, analysis and utilization of information to trace progress of a program with the aim of achieving the goals and objectives and to provide guidance for management decision making. The focus of monitoring is on the procedures like at what point does a task take place, at what section in the project, who is responsible for the tasks and the number of entities they can reach. Supervision of these functions essential to ensuring the project is on the right path and on time to achieving the objectives. Until the program in on progress, monitoring is applicable to the whole project to

ensure the progress, and other factors are put into consideration and to minimize risks involved and increase sustainability of projects (Sarah del Tufo, 2002).

Figure 2.4. Illustration of program monitoring on project evaluation management



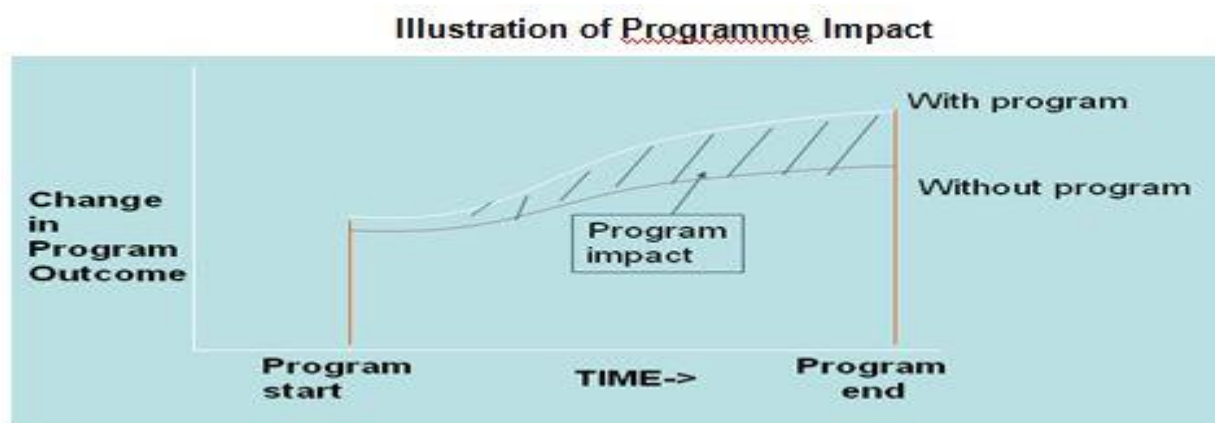
(Author; Gage and Dunn 2009, Frankel and Gage 2007)

Project Evaluation management; involves a local assessment of the project, strategies policies and operational performance focusing on the expectations and achievements through valuation of the chains of results, procedures, factors in the context and causalities to bring compression to the deficiencies in the project. Project Evaluation management process is aimed at determining the weaknesses in the systems that prevents efficiency, effectiveness and interventions sustainability and their cumulative contribution to the outcome to the whole project. The results of an evaluation are based on the evidence in a credibly, reliably and useful manner. These results then translated to the recommendations and experiences that will influence the future decision-making processes under the same programs. It provides insights of previous on current

activities to provide a clear pathway for future investments based on sustainability of projects in the same initiatives (Freeman, 2004).

The utilization of a logical, rigorous and scrupulous scientific methods applications of techniques to conduct an assessment on the design, enactment, enhancement and results of an initiative. Out of these functions there are two possible outcomes, formative and summative results. The former is aimed at providing information on the improvement of the processes or the products and the latter provides short-term efficiency or the ultimate results to the process adoption.

Figure 2.5. Illustration of program impact on project evaluation management



(Author: Gage & Dunn, 2009; Frankel & Gage, 2007)

Reeve & Paperboy (2007), describes Relevance as the extent of suitability of the priorities and policies of a recipient, group or donor to enable sustainability. In evaluation relevance comprises asking of questions like: to that extent will the validity of the objective of the initiative be? Do the functions and results of the program concur with the overall objective and its specifics? Are the functions and outcomes consistent with the prospected effects and impacts?

Effectiveness; refers to the extent to which the objective of an initiative can be attained. The following questions are relevant to achieving these goals: what is the likelihood of the objectives to be achieved? What are the key indicators that influence the extent of the sustainability objectives achievement? (Staff, 2011).

Efficiency; quantifies the outcomes in quantitative and qualitative aspects with regards to the inputs of sustainability in projects. (Mongiat, 2009), justifies economically the cost of resources needed for the achievement of these resources and bringing in comparisons of the alternative techniques to the achievement of the results and adopts the most efficient option to ensure sustainability. The following question need to be addressed: what activities are cost efficient? Were objectives timely achievable? Was the initiative implemented in the most efficient manner with regards to the alternatives?

Impact; are both negative and positive contribution in a project for better development both directly and indirectly, meant or unintended (Potter, 2006). The main contributors originate from the local, economic and environmental and developmental factors impacting to the external factors like variations in trade and finances. The following questions are useful to evaluating the impact: what was the effect of the program to the community? How has the project affected the activities of the beneficiaries? How many individuals has it inclined?

Sustainability; refers to the extent to which the initiative can function after its completion without further actions to its operations as proposed by (House, 1978). Sustainability is determined by the following question that need to be addressed: for how long is the initiative likely to continue serving after donors cease funding it? What are the key factors implicating to the extent of the achievement of sustainability of the initiative?

Management Audit is an organized scrutiny of choices and actions employed by management to analyze performance. Management audit comprises assessment of managerial facets like organizational objective, policies, procedures, structure, control and system to check the efficiency or performance of management in relation to activities of the Company. Management audit primarily survey non-financial information to audit the efficiency of the management. Consequently, audit attempts to answer how sound management has remained operating the company business, managerial style best suited for business operation, and management Audit focus on results (Osmond, Vitez, 2015).

Jones and Gemma, (2015) explains auditing as a logical and independent evaluation of documents, statutory records, accounts, books and of a firm to confirm the extent of statements for both financial and non-financial revelations show a fair and truth of the concerns as required

by the law. The activity has been ubiquitous in both the private and public organizations such that scholars have formed audit society where the auditor extricates and recognizes the proposals before the evaluation, collects the evidence and examines them and articulates opinions based in his observations and judgments expressed through reports. An audit is objective on examining and evaluating the financial statements of the project to ensure sustainability and the records are a fair and duplicate of the transactions claimed to have taken place. Audits can be conducted in house or outsourced from an independent organization. There are different types of audits as follows; Performance audits; these are audits conducted to examine security and information systems security to determine the level of security, safety, performance of information systems and its environs. It also generates reports of performance for non-profit organization and government agencies in the determination process of satisfying the objectives' mission. Quality audits; this is the verification of conformance through standards quantification for effectiveness of the systems of quality management certifying ISO 9001 that ensure sustainability. They are objective during the verification of conformance of processes requirement to evaluate its successful implementation and rationalize how effectiveness can be achieved in certain target levels to minimize problem in the processes and facilitate continuous improvement of performance. The report contains both the non-conformance and conformance practices in the organization as well as provide evidence of each claim as claimed by (Chatfield, 1974)

Project management audit; Project management audit provides opportunities for uncovering issues, challenges and concerns experienced through the whole project life cycle. When conducted midway the project, the report informs the project manager supervisor and the whole team of that has transpired in during the project what has been successful in meeting the objectives and what needs improvement. If conducted at the end of the project it's meant to provide insights for developing success criteria for future project through the forensic reports. Both the challenges and successes are addressed and evidence accompanied to thus provide continuous improvement strategies. There are two types of project management auditing, regular audits and regular health check audits. The latter is conducted to diagnose the status of the project to ensure the objectives will be met for project success and sustainability as described by (Stanleigh Michael, 2009). In his book titled undertaking successful sustainability of projects.

Operational audit; the operations of the clients are examined how efficient, effective and economical they are in achieving their objectives. Both the internal and external controls are examined to ensure the client operations are satisfactory to the compliance. Operational audit evaluates the three E's for Effectiveness – performing the right actions to refuse on resource wastage, Efficiency – operating on minimal time possible and economy, balancing between revenue and operational costs of the project and sustainability as argued by (McKenna, Francine, 2011). Forensic audits; the investigation of accounts with the aim of uncovering fraud, negligence and unaccounted funds. It is performed on site to verify the processes and quality systems to facilitate complying with the requirements on the whole firm or operation, production phase or the procedures. Other audits include the product audit, process audit, systems audit, quality management system audits.

Audit phases; Audit preparation – these are measure made by parties of interest to ensure there is compliance with all the objectives of the clients. It begins with the decision to conduct the audit and the stage ends with the starting of the auditing in action. Audit performance – also referred to as firework, it's comprised with the data gathering which lasts between the arrival to the location of audit to the exit meeting. There are activities involved at this stage including the management of on-site audit, auditee's meetings, compression of the processes and system controls and the verification of their full functioning, team and auditee communication to maintain sustainability as illustrated by (Moyer, 1951).

Audit reporting – It is the presentation of the results generated in the audit report providing data that is clear and accurate effective to help the management to address the essential issues in the organization. The process can end with the issuing of the report by the lead auditor or action plans completion. Audit follow up and closure – The process is complete when the planned activities have been exhausted or an agreement with the client to close the activity according to the ISO 19011, clause 6.6 and the next clause continues by outlining that verifying the follow-up action is comprised in the succeeding audit process as exemplified by (Clarke & Walsh & Flanagan, 2015).

Audits are useful in reassurance to the customers of the compliance to the law to protect their engagement and transactions with certain organizations or corporations and ensure sustainability of projects or products. The certification is essential in the compliance to the pertinent standards

of an audited system of organization management. Most practices such as value-added assessment, audits in the management, auditing on value added and assessment on continual improvement. It not only relates to the traditional conformation and compliance to audits but also in the performance of the organization. Therefore, there is a difference between the audits in terms of organizational performance and its conformation to the procedures and regulations in terms of the evidence collected relating to the performance against what is collected regarding the procedures and processes to ensure sustainability as indicated by (Gilbert & Terry, 2015). Even as the recommendations are provided for the inefficiency in the performance or deficiency in the following of procedures, following up is conducted to make sure alignments are done. However, the cost of running a follow up audit process can be high thus the management tends to combine it with the following audit process. Only through the follow up audits can it be confirmed on the action plans worked on and that measures have been made to prevent further deterioration of conditions and maintain sustainability as proposed by (Amat, 2008).

2.3 Summary and Research Gap

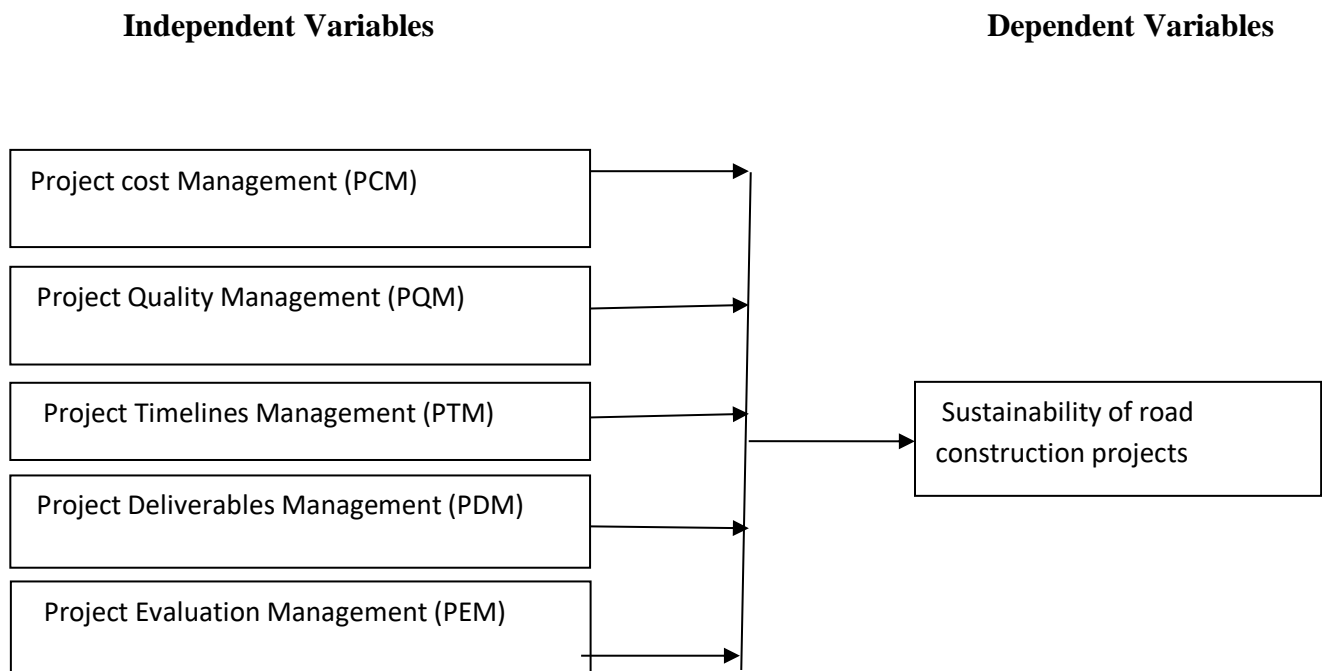
The available literature review shows several factors that affected sustainability of the construction projects by reviewing their effectiveness and efficiency of project planning. For example, Ofori et al., (2004), more than a decade, reveals the weaknesses in project management planning including lack of proper audits, evaluation processes, the supply of raw material was unreliable, and poor communication channels through the project. Other authors, World Bank (2003), show there was poor management of processes such that contractors are taking too long to reach financial closure caused by unprecedented delays, land disputes, feeble communication and coordination and constraints in finances and lengthy control structure put in place that affect sustainability of projects.

Such conditions in the construction industry have prevented sustainability of the constructed roads in the countries. In Kenya, the poor conditions of the roads have raised alarms on the processes and planning engagements involved. The transparency of the factors is still wanting and in this research, it is intended to investigate the reliance of the project planning to create sustainability in the context of China WuYi Co; Limited constructions in Kenya.

2.4 Conceptual Framework

A concept is a term or symbol that represents similarities in otherwise diverse phenomena (Labovitz & Kagedom, 1976) or a concept is a term or symbol or a guide or a perception idea or a theory that demonstrates and represents similarities in otherwise diverse phenomena. Framework is the illustrations that outlines the structure of the agenda and indicates the Skelton of the support.

Figure 2.6: Conceptual Framework



Author (2017)

The conceptual framework is a diagrammatical presentation of variables in the study. The framework illustrates the interrelationship between dependent and independent variables. The independent variables of the study are the various factors constituting actionable aspects of a project management plan. The dependent variable is the sustainability of project road construction.

Brief Explanation of Variables:

2.4.1: project Cost management (PCM)

Project Cost management is the practice of finding and deducting business costs to grow profits, and it begins with budgeting process. A business proprietor compares real outcomes to budget expectations, and incase actual costs get higher than anticipated, management acts. Project Cost management is the actual costing of projects. This is where the actual price of materials and construction items are realized by calculating the cost of constructing the road projects. Cost control ensures value for money is achieved by coming up with actual construction budgets of the projects enables sustainable road construction projects (Augsburg, 2012).

(Kathy Schwalbe, 2014), expounds Project Cost management as the process of project planning on monitoring costs connected with an activity, process, or company. Cost control and reduction refers to efforts employed by business managers to monitor, evaluate, and reduce expenses. For price control on a road construction project, the construction design and linked cash flow approximations can offer baseline position for succeeding project monitoring. Cost is among significant performance indicators for projects. Controlling costs are processes placed around resource planning, cost estimation, cost budgeting, and cost control (Rad, P.F. 2002).

2.4.3: Project Quality Management (PQM)

Project Quality Management is a project planning system of upholding standards in construction through trying a sample of output in comparison with the requirement to allow its sustainability. Project Quality Management, or (PQM) for short, is a process in which entities assess the quality of factors of production involved. ISO 9000 defines quality control as ‘‘A part of project planning focused on fulfilling quality sustainability requirements such as road construction projects’’ (Gryna, 1993)

Project Quality Management is an application of project planning of the quality assurance procedures followed during construction of sustainable road projects. Quality assurance (QA) is a way of avoiding errors in manufactured products and evading problems when providing solutions this guarantees construction of long term quality sustainable roads. Project Quality Management is enhanced on the designs of the road and ensures that all specifications of materials and materials and activities specified in the designs and construction procedures and set testing are followed to the letter to ensure quality sustainability of road projects as defined by (Dale, 1994)

Project Quality Management seeks to ensure that sustainable road construction product quality is maintained or improved and road construction errors/ mistakes or defects are reduced or eliminated for sustainability on road construction projects. Thus, project quality management is a project planning aspect of the, quality control, quality assurance, quality customer satisfaction and quality continual improvement process that consists of activities employed in detection and measurement of the variability of sustainability of road construction projects (Endres, 2000)

2.4.3: Project Timelines Management (PTM)

Project Timelines Management is a project planning technique of presenting a list of procedures in sequential order, occasionally labelled as project artifact. Typically, it's a graphic design displaying extended graphical illustration of activities approved in a project from conception to completion, to handing over. Project Timelines Management employ any time scale, based on the subject and data. Majority of timelines use a linear scale, where unit of distance equals set total of time. This time scale is dependent on the events in the timeline. While most timelines use a linear timescale, for large or small time spans, logarithmic timelines use a logarithmic scale to show time to certify sustainability (Ivy Lee , 1930).

Road projects are designed to have specific Project Timelines Management, starting from identifying scope management, activates, schedules, resources, timelines and building timeline management plan reliant on scope of the project and activities involved. In highest cases, projects must be completed at the set timelines. If the road projects are not completed within the set timelines, issues of delay, additional cost and unnecessary claims makes the road project to

consume more cash flow than it was planned making the project unsustainable. Also, if the project is delayed, the beneficiaries of the project are not able to get the benefits as planned and hence confuse the stakeholders and uses of the project making the project unsustainable. If the project is completed within the set timelines, the road project is sustainable as the project is completed in time without unnecessary delays and other additional costs then sustainability of road construction (Francesco, 1992)

2.4.4: Project Deliverables Management (PDM)

Project Deliverables Management (PDM), is a tangible or intangible good or service produced as outcome of a project intended to be distributed to a customer internally or externally. A deliverable could be a construction project, a report, a document, a software product, a program, a server upgrade or any other building block of an overall project. A deliverable constitutes various minor deliverables. It may likewise be a result to be achieved or an output to be provided (Kermit Burley, 2015)

Deliverables rely on completion of other deliverables leading; this is not unusual in projects with numerous succeeding milestones. This way, there exists a probability of saving of time and cost reducing greatly the complete project crucial supply term. This designing activity is indicated in the drawings with an intention as design drawings, or construction drawings or delivery drawings around an intended part which would be completed far ahead or at delivery of project. The part proven can be delivered to interested persons or as per intended beneficiaries. A deliverable varies from a project schedule, goal or milestone in that a goal, a schedule or a milestone is a quantification of progress toward productivity or outcome, whereas the deliverable is the yield delivered to a customer, a stakeholder or sponsor. Actually for a distinctive project, a goal, a schedule or a milestone might be the accomplishment of a product design, while the deliverable might be the technical diagram or detailed design report of the product to sustainability as designed for the client or customer with an intended purpose as defined by (Bernie Roseke, 2013)

2.4.5: Project Evaluation Management (PEM)

Project Evaluation Management is a process or a system that intends to advance performance and achieve better outcomes. PEM is designed to advance current and future project planning management of outputs, outcomes and impact. It is mainly used to evaluate the performance of projects, deliverables, services, institutions and programs set up by companies, institutions and governments, international organizations and NGOs. Project Evaluation Management establishes links between the past, present and future actions to guarantee sustainability by Monitoring, evaluation, and auditing processes to assess activities. This is done by an independent branch of the implementing organization, an internal auditor, or by the project managers or implementing team themselves and/or by a private company or by monitoring and evaluation team. The integrity, reliability and objectivity of monitoring, evaluation and auditing reports depend very much on the independence of the monitors, evaluators and auditors. Their know-how expertise, capabilities, knowledge and independence is of major importance for the process to be successful on sustainability as directed by (Smith, 1993)⁴

Monitoring, evaluation and auditing are major tools of project evaluation management and are continuous assessment that aims at providing all stakeholders with early detailed information on the progress or delay of the ongoing assessed activities. In other words, monitoring, evaluation and auditing are detailed oversight of the activity's implementation stages. The PEM major purpose is to determine if the outputs, outcomes, milestones, goals, deliveries and schedules planned or targeted have been reached or attained so that action, collections can be taken to correct the deficiencies as quickly as possible to sustain sustainability of services or projects. Good project planning, combined with effective monitoring, auditing and evaluation, can play a major role in enhancing the effectiveness of development programs and projects sustainability. Effective project planning helps focus on the results or outcome of the intended matter, while project evaluation management help all stakeholders learn from past successes and challenges and enlighten strategic informed decision making so that current and future initiatives are better able to improve people's lives and expand their choices to attain sustainability as explicated by (House, 1980)

The major idea in carrying out project evaluating management in projects is to separate errors or past mistakes or previous challenges not to be recurring them and to strategize and underline and promote the successful mechanisms for current and future projects and guarantee sustainability.

Project evaluation management provides an important goal of monitoring, evaluation and auditing to provide recommendations and lessons to the project managers, project planners and implementation management, technical and operational teams that have worked on the projects and also, for the ones that will implement and work on similar projects in future. Project evaluation management are also indirectly a means to report to the donor, the sponsor, the government of the activities implemented and the collections to be infused to improve on sustainability of projects. Thus PEM, is a means to verify that the donated funds, the provided budgets are being well managed and transparently spent in pursuance to the set deliverables within the set timelines and established specification and qualities. Thus the monitors, evaluators, auditors in the project evaluation management are supposed to check and analyze the cost budget lines, the quality specification, the project timelines and the project deliverables and to report the findings in their work on sustainability as argued by (Michael, 1998)

2.5 Summary

Project planning is a measure to attaining sustainability to the road construction projects. It depends on the control of project cost management to facilitate sticking to the budget allocated to the completion of the project. Also, alongside sustaining the project quality management of operation, quality of the project should be upheld to ensure they serve for a longer period of time efficiently. The sustainability of the project is depended on the project timelines management for schedule allocation and ensuring all the activities are met as schedule to avoid delay for the implementation of these projects to meet the goals of the organization as explained by (Sadler, Barry 2009).

Above all achieving the project deliverables management for a project is beneficial to the clients to achieving their business goals to satisfy their customers and ensuring sustainability for road construction projects. Lastly project evaluation management is essential to ensure efficiency on the utilization of the resources provided and curb on losses from fraud and unnecessary processes or activities in the project development on sustainability. The thematic literature review has provided insights to the mentioned variables to achieving the sustainability to the road project construction. The gap in the research has been identified in reference to previous scholars addressing similar factors contributing to the sustainability of road construction projects both globally and regionally (Hak T, 2007).

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This section dealt with the description of the methods applied in carrying out the study. It described the research design, target population, sampling technique and instruments for data collection, data procedures and data analysis.

3.2 The Study Design

China wuyi Company (CWY) case study utilized descriptive research design. According to (Cooper & Schinder, 2008), descriptive research design answers the questions on who, what, when, where and how. The research used qualitative and quantitative research methods.

Qualitative research means the findings was not based on statistical data analysis process but rather quantification as opined by (Strauss and Corbin, 1990). The research design addressed the manner in which the researcher undertook the project, collected data and further found out the methodology used in order to have a realistic result which was true representation of the reality on the ground as addressed by (Gregory, 2007). The research was a case study as it involved the observation of social units with an emphasis of how deep the issues are rather than it is. Furthermore, a case study was essential when underscoring the data available to reach a meaningful conclusion while recommending what can be done better as described by (Mugenda & Mugenda, 2003). It provisioned for skimming through multiple information sources that could be quantified through comprehensive probing as styled by (Cooper and Emory, 1996). This ensured that the data collected was not distorted. Questions of all nature were adequately addressed which raised the chances of success of the project being undertaken as defined by (Callahan, 2001).

3.3 Target Population

(Mugenda, 2003) hinted that target population is the population upon which the researcher uses to generalize the outcome of the study being undertaken. The specific group from where the researcher draws the simple size using a given sampling method or criteria. (Castilo, 2009) further indicated target population to comprise an entire group of individuals a researcher is interested in generalizing the conclusions. It is a well-defined collection of object or individuals with similar characteristics. The population of interest in this study comprised of the China WuYi Company employees. The focus was on management staff and other employees who are normally involved in the construction projects. The company has a population estimate of about 324 employees, both permanent and contractual. The table below shows the target population;

Table 3.1: Target Population.

Department/section	Target population	Percentage
Directors	6	1.90
Chairman	1	0.30
Managing Director	1	0.30
General manager	4	1.20

Top managers	15	4.60
Quality manager	8	2.50
Cost manager	6	1.90
Human resources	4	1.20
Supervisors	18	5.50
Site Engineers	25	7.70
surveyors	8	2.50
Technicians	35	10.80
Internal auditors	4	1.20
Subordinate staff	70	21.60
Operators	40	12.30
Drivers	75	23.10
Personal secretaries	4	1.20
Total	324	100

Author (2017)

3.4 Sample Design

Wiersma (1980) describes a sample as a small portion of a target population selected using some systematic procedure for study. Stratified random sampling design was used in the study. A sample of 30 % was drawn from each stratum from which respondents were selected. The stratified random sampling method was best suited for this research because the population is heterogeneous. The researcher was convinced that the population was not uniform; since the staff in the different sections within the construction company didn't think similarly over the given issue under investigation. The table below shows the sampling frame;

Table 3.2: Sample Size

Population categories	Target population	Sampling population	Percentage
Directors	6	2	30
Chairman	1	1	30
Managing Director	1	1	30

General manager	4	1	30
Top managers	15	5	30
Quality manager	8	3	30
Cost manager	6	2	30
Human resources	4	1	30
Supervisors	18	5	30
Site Engineers	25	8	30
Surveyors	8	3	30
Technicians	35	11	30
Internal auditors	4	1	30
Subordinate staff	70	20	30
operators	40	12	30
Drivers	75	22	30
Personal secretaries	4	1	30
Total	324	99	30

Author (2017)

3.5 Data Collection Methods and Instruments

3.5.1 Questionnaire Survey

The research collected data for this study using a questionnaire. The questionnaire contained open and closed ended questions. This ensured that the structured and unstructured questions were satisfactorily answered

3.5.2 Interview

The researched used well defined interview schedules to collect data as the study was connected to the variables that couldn't be observed directly for instance as perceptions, opinions, views and feelings of the respondents. The interview data collection tool facilitated the collection of data as per the illustration of (Touliatos & Compton, 1988).

3.6 Reliability and Validity

According to (Mugenda and Mugenda, 2003), validity is the precision and significance of inference founded on the research outcomes. It's the extent which outcomes attained after the analysis of the data represents the phenomenon under study. The entire target population was literate and therefore there was minimal complications while answering the questionnaire. The research collected data for this study using a questionnaire. The questionnaire contained open and closed ended questions. This ensured that the structured and unstructured questions were satisfactorily answered. The utilization of closed ended questions was to facilitate getting relevant data from the respondents. The questionnaires were subjected to scrutiny by researcher's supervisor and other research experts for validation purposes

Reliability of research instrument in research and pilot testing reliability refers to the consistency measure of the characteristic of interest in time, (Ahmed, 1994). According to (Mugenda and Mugenda, 2003), reliability is a measure of the degree to which research instrument produces consistent outcome or data after frequent trials in research. To guarantee reliability of the instrument, a pilot study was carried out. The instrument was pretested through a pilot study before the actual data collection to enhance reliability. The importance of pretesting questionnaire according to (Crewel, 1999) is to help the researcher understand the meaning of the question to respondents and on how they arrived at their response. The researcher phrased questionnaire questions with clarity to provide clear dimensions of analysis for the research. As for the open ended asked questions, there was a space provision enough to lay out key concepts. The respondents were assured of the confidentiality of the information provided. The questionnaires were piloted before the main dispatch was conducted to streamline the questionnaire and ensure relevant data was collected at China Wuyi offices.

3.7 Data analysis Methods and procedures

Data analysis, similarly acknowledged as analysis of data or data analytics, is a process of checking, cleansing, transforming, and modeling data with the aim of realizing useful information, suggesting conclusions, and backing decision-making (McClelland Gary, 1989). Data analysis has numerous facets and approaches, consisting diverse techniques under an assortment of names, in different business, science, and social science domains. This process

started momentarily after the data collected after which was interpreted to provide insights useful for the study as argued by (Heller stein Joseph, 2008).

Effective analysis necessitates obtaining pertinent facts to answer questions, support a verdict or formal opinion, or test hypotheses. It began with sorting and indexing of questionnaires to facilitate ease evaluation, data editing (reading through the filled questionnaire to spot any inconveniences and or errors which might have occurred during data collection), data cleaning, accuracy determination, examination of flawed data, completeness and consistencies to avoid going back and forth get clarity of data obtained). Analysis of the data collected was both qualitative and quantitative so that the analysis was to cover every aspect of the data collected. The researcher presented the data using statistical package for sciences (SPSS) which enabled the use of percentages, bar graphs, frequency tables and pie charts. Qualitative method involved analyzing content and evaluating of text material. The open-ended questions were analyzed qualitatively. Quantitative method involved utilization of charts diagrams and tables, frequencies and percentages. Thus, the close-ended questions were analyzed quantitatively in pursuance to (Chekanov. S, 2016).

3.8. Ethical consideration

The respondents approached were reluctant to give information fearing the information they give could be used to intimidate them or paint a negative image about the company. The researcher assured the respondents that the information they gave was to be treated confidentially and it was purely for academic purposes and that it would not be used to intimidate them or paint a negative image about the company.

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION

4.1 Introduction

This chapter presents and analyses the data gathered during the research study. It provides the findings of the analyzed data of the respondents through questionnaires. The data is presented logically by use of numbers, pie charts, and percentage graphs. Qualitative and quantitative data analysis was used as one of the most effective and efficient methods of data interpretation providing precise presentation as well as interpretation of the research study.

4.2 Questionnaires Response Rate

Out of the 99 distributed questionnaires, 69 of them were returned fully filled representing 70% of the intended respondent that enabled the researcher to gather relevant and enough data needed

for the analysis. This indicated a high response rate. 30 of the questionnaires were not returned by the respondent thus representing 30% which had little effect on the results. From the researchers view, the failure to respond to questionnaire might have resulted from the unwillingness by the respondents to fill the questionnaires, lack of adequate time to respond to the questionnaires and that some of them might not have been present the day the questionnaires were being returned to the researcher.

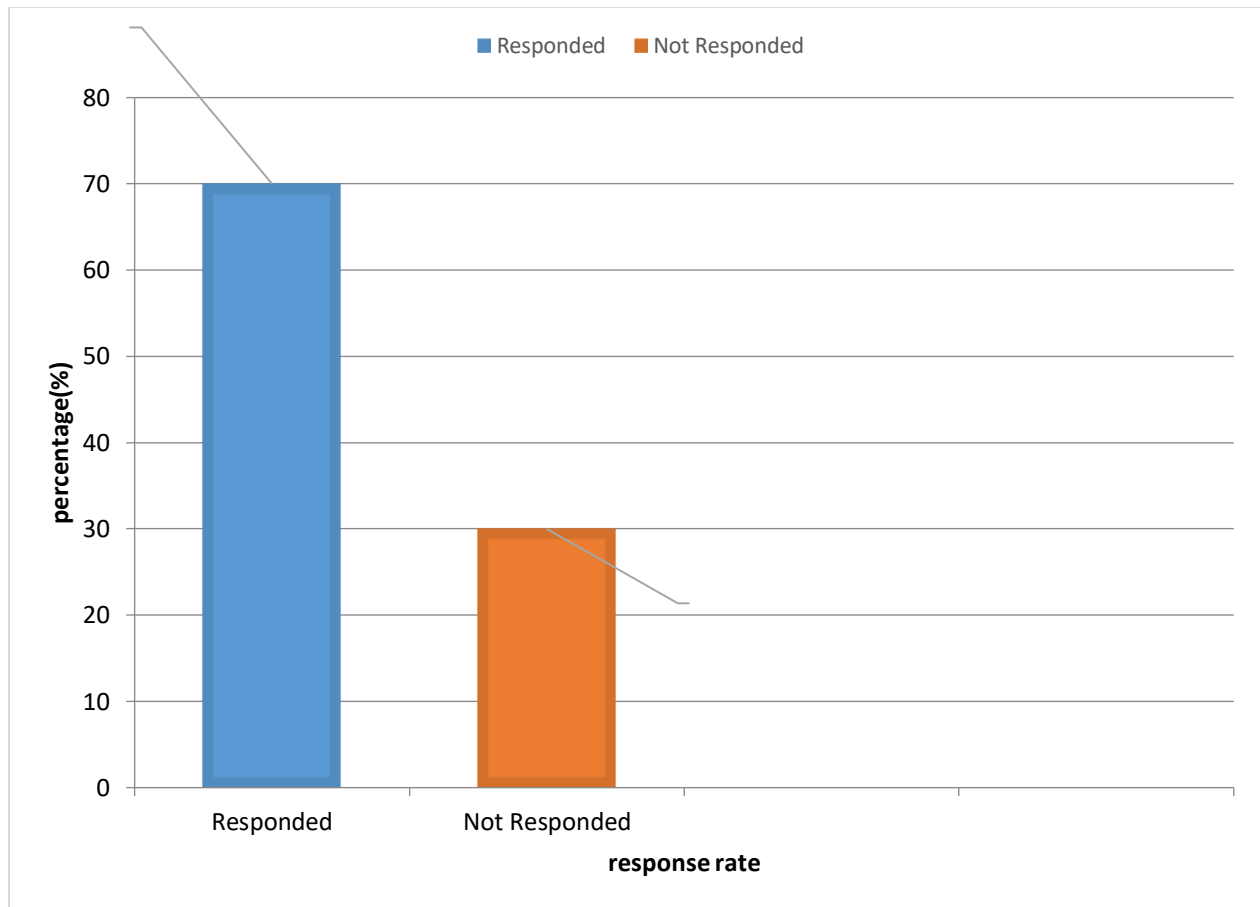
The response is as indicated on the table below.

Table 4.1: Questionnaires Response Rate.

Category	No. of respondents	Percentage
Responded	69	70%
Not Responded	30	30%
Total	99	100%

Author (2017)

Figure 4.1: Questionnaires Response Rate.



Author (2017)

The table 4.1 and figure 4.1 above shows the questionnaire response rate. 70% of the respondents responded to the questionnaires. 30% of them did not respond.

4.2.1 Demographic Information

The demographic information for the study for the information was based on gender, marital status, and age. The data obtained was analyzed quantitatively as shown below.

4.2.2 Gender of Respondents

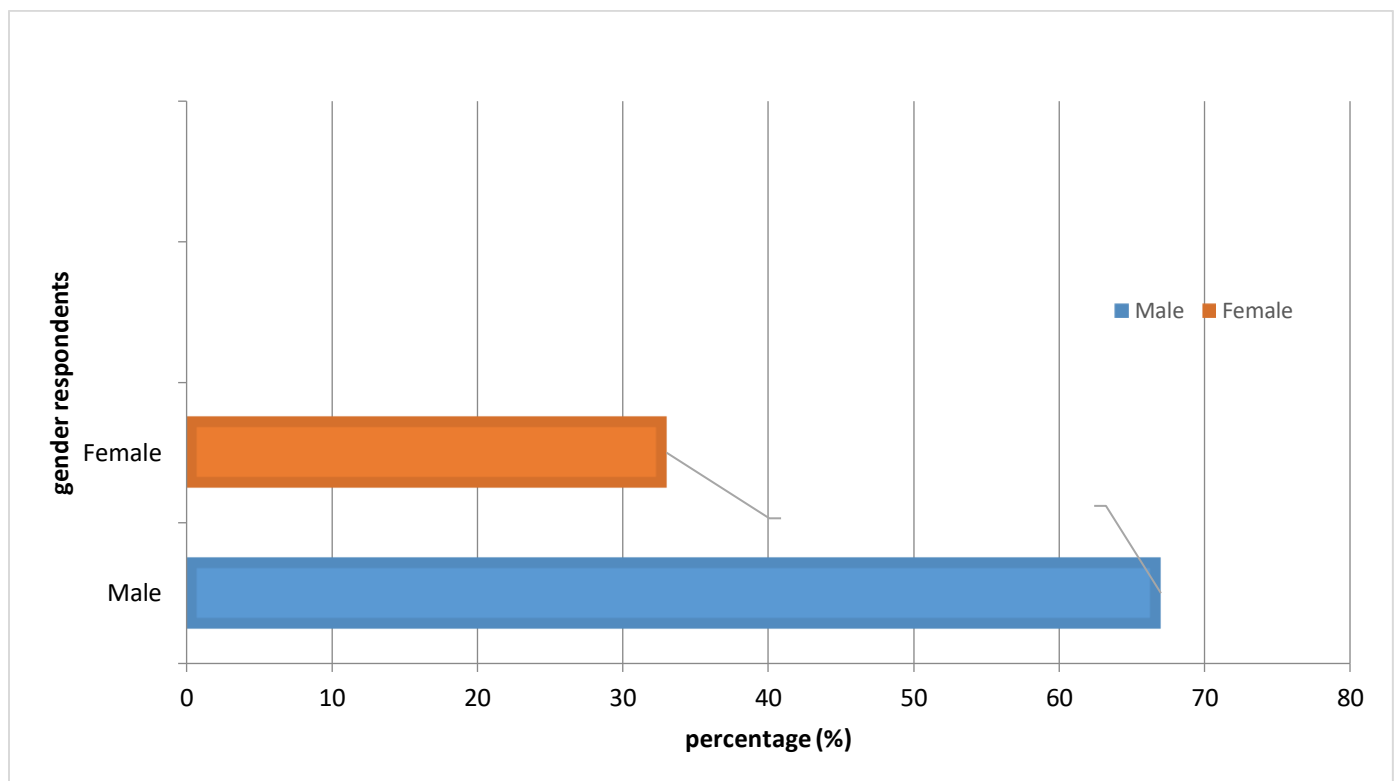
The gender that was involved in the study and who responded to the questionnaires was composed of male and female. The results were tabulated as shown below.

Table 4.2: Gender of Respondents.

Category	No. of Respondents	Percentage
Male	46	67%
Female	23	33%
Total	69	100%

Author (2017)

Figure 4.2: Gender of Respondents.



Author (2017)

From table 4.2 and figure 4.2 above, there is an indication that many male respondents participated in answering the questionnaire than their female counterparts. 67% of the respondents represented the males while 33% represented the female.

4.2.3 Marital Status

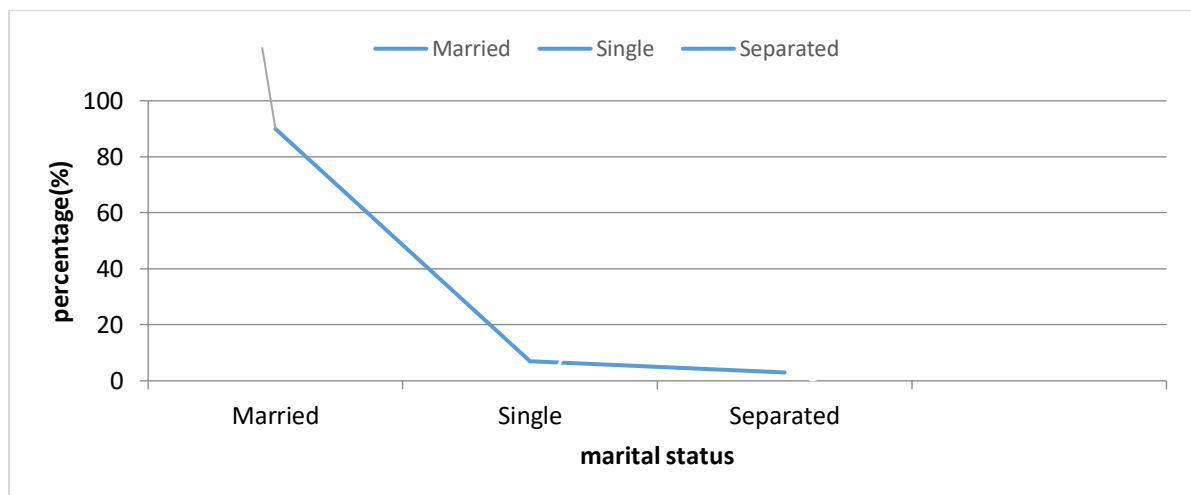
From the questionnaires, the respondents were asked to give their marital status. The results were tabulated as shown below.

Table 4.3: Marital Status.

Marital Status	No. of Respondents	Percentage
married	62	90%
Single	5	7%
Divorced	0	0
Separated	2	3%
windowed		0
Total	69	100%

Author (2017)

Figure 4.3: Marital Status.



Author (2017)

The table 4.3 and figure 4.3 above, shows the marital statuses of the respondents. The researcher noted that 90 of the respondents were stated that they were married, 5% stated that they were single while 3% stated that they were separated. The options for windowed and divorced were not attended by any of the respondents.

4.2.4 Age Categories

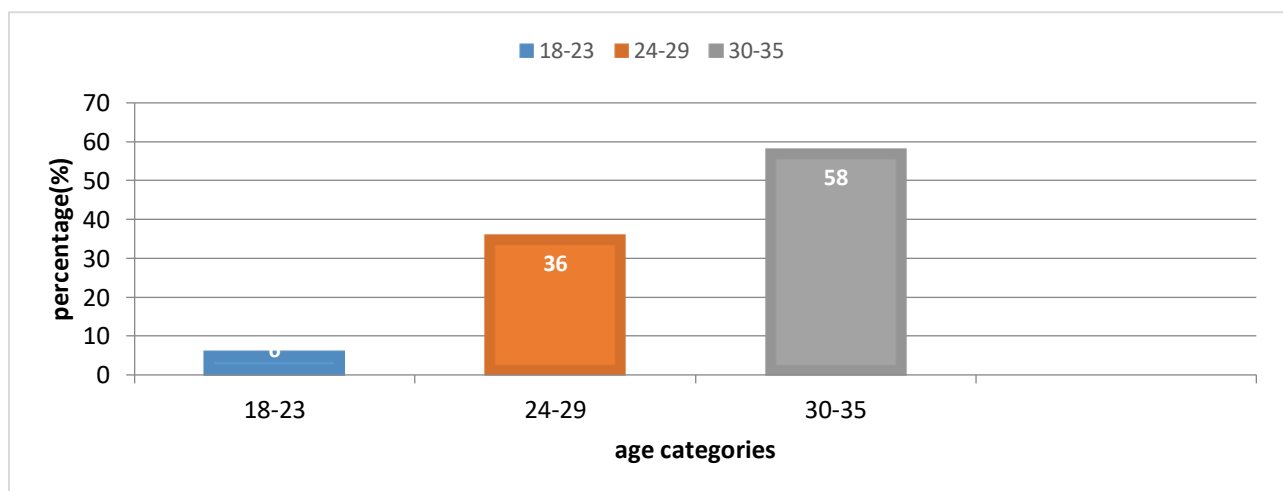
In the study, the respondents stated their ages. Categories of their ages is as shown in the table below.

Table 4.4: Age Categories.

Age categories (in yrs.)	No of Respondents	Percentage
18-23	4	6%
24-29	25	36%
30-35	40	58%
Total	69	100%

Author (2017)

Figure 4.4: Age Categories.



Author (2017)

From the table 4.4 and figure 4.4 above, it is evident that a large number of the respondents ranged between 30 to 35 years that represented 58% of the respondents. It was followed closely by the age between 24 to 29 years. Finally, the age between 18 to 23 years that represented 6% of the total respondents.

4.2.5 Level of Education

Education level of the respondents was a key factor as identified by the researcher. This is because education level is an indication of competency regarding skills and knowhow to tasks allocated and which highly valued within the company.

The table below shows the number or respondents and their levels of education.

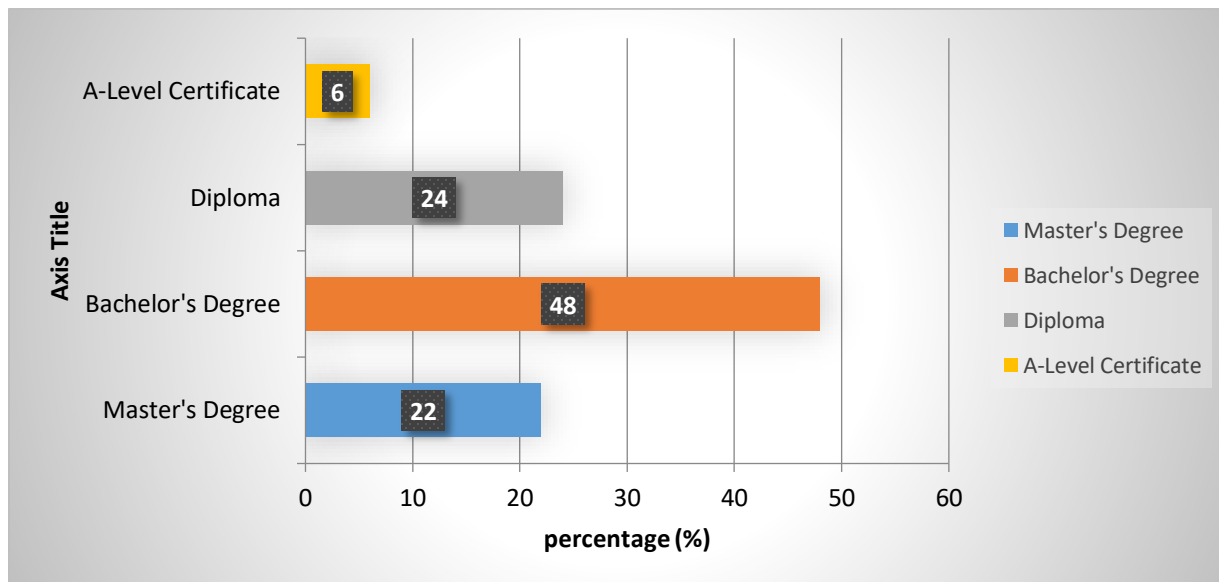
Table 4.5: Level of Education.

Level of education	No. of Respondents	Percentage
Master's Degree	15	22%
Bachelor's Degree	33	48%
Diploma	17	24%
O-Level Certificate	0	0%
A-Level Certificate	4	6%
Total	69	100%

Author (2017)

The figure below shows the respondents education level. The researcher noted that 22% of the respondents had master's degree, 48% had Bachelor's Degree, and 24% had Diploma while the rest 6% had A-level Certificates. The 0-Level Certificate option was not attended by any of the respondents.

Figure 4.5: Level of Education.



Author (2017)

4.2.6 Respondents of other specialist form of training in planning or management

The researcher had requested the respondents to indicate whether they have any form of specialized training in planning or in management and the table below shows the results obtained by the researcher.

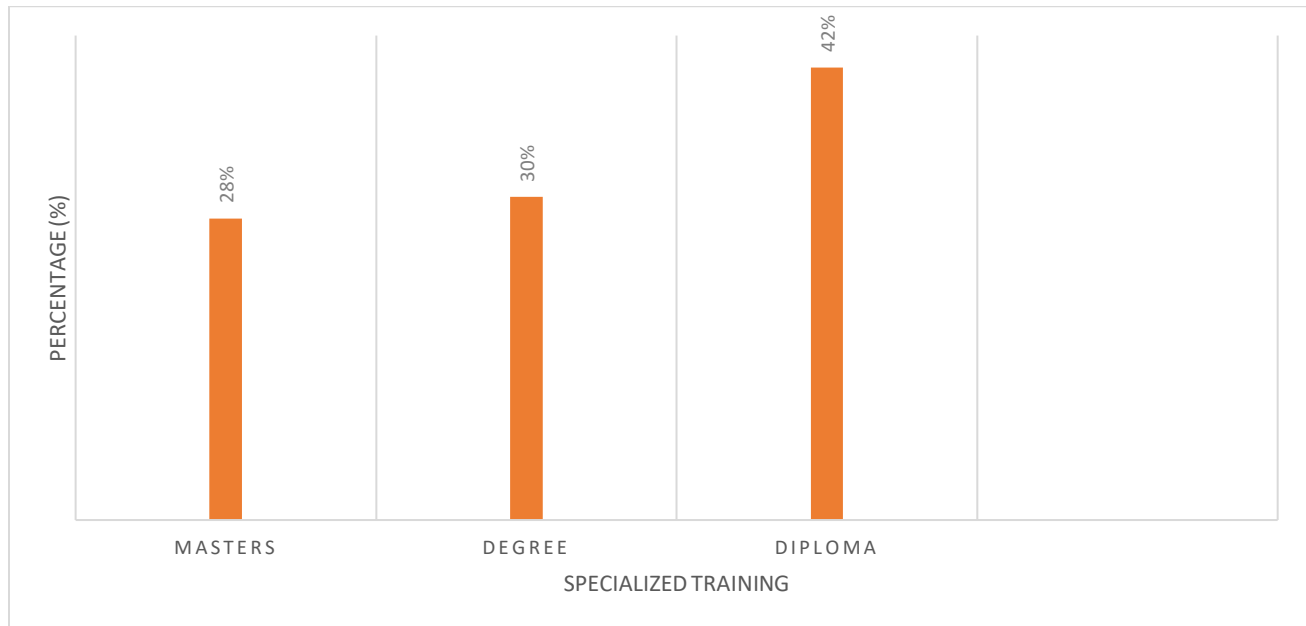
Table 4.6: Respondents of Other Specialist Form of Training in Planning Management.

Specialized Training	No. of Respondents	Percentage
Masters	19	28%
Degree	21	30%
Diploma	29	42%
Total	69	100%

Author (2017)

The researcher noted that the 28% of the respondents with masters had specialized training in planning and/or in management. 30% of the respondents with degrees and 42% of respondents with diplomas had special training in planning and/or in management.

Figure 4.6: Respondents of Other Specialist Form of Training in Planning Management



Author (2017)

4.2.7 How would you rate sustainability in road construction projects?

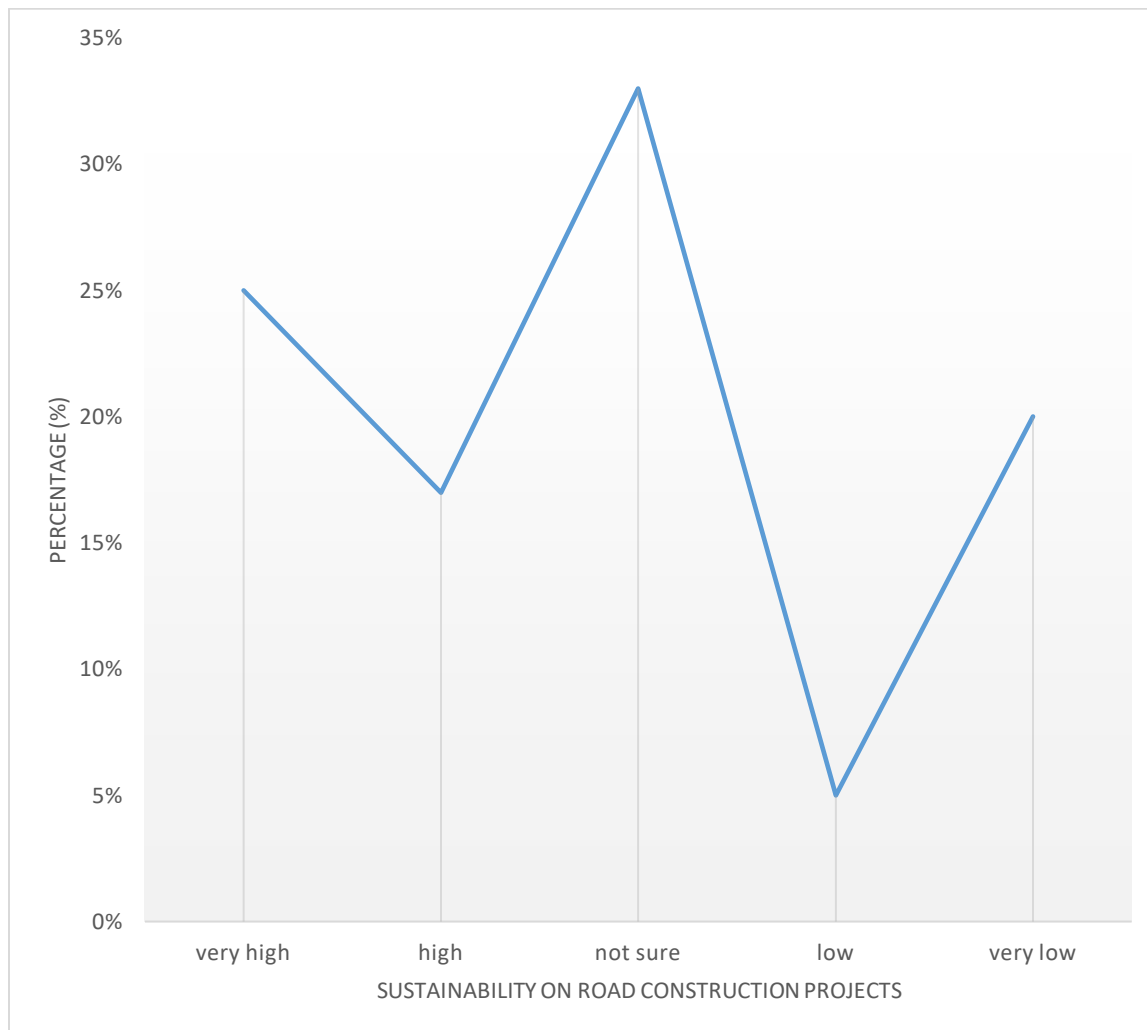
The respondents rated the sustainability in road construction projects as presented in Table 4.7.

Table 4.7 how would you rate sustainability in road construction projects?

Ratings	Frequency	Percentage
Very high	15	25
High	10	17
Not sure	20	33
Low	3	5
Very low	12	20
Total	60	100

Author (2017)

Fig 4.7: how would you rate sustainability in road construction projects?



Author (2017)

Thirty three percent (33%) were not sure about the rate of the sustainability in road construction projects, 25% rated as very high, 20% rated as very low, 17% rated as high while only 5% rated as low.

4.2.8 Respondents on Project Cost management (PCM)

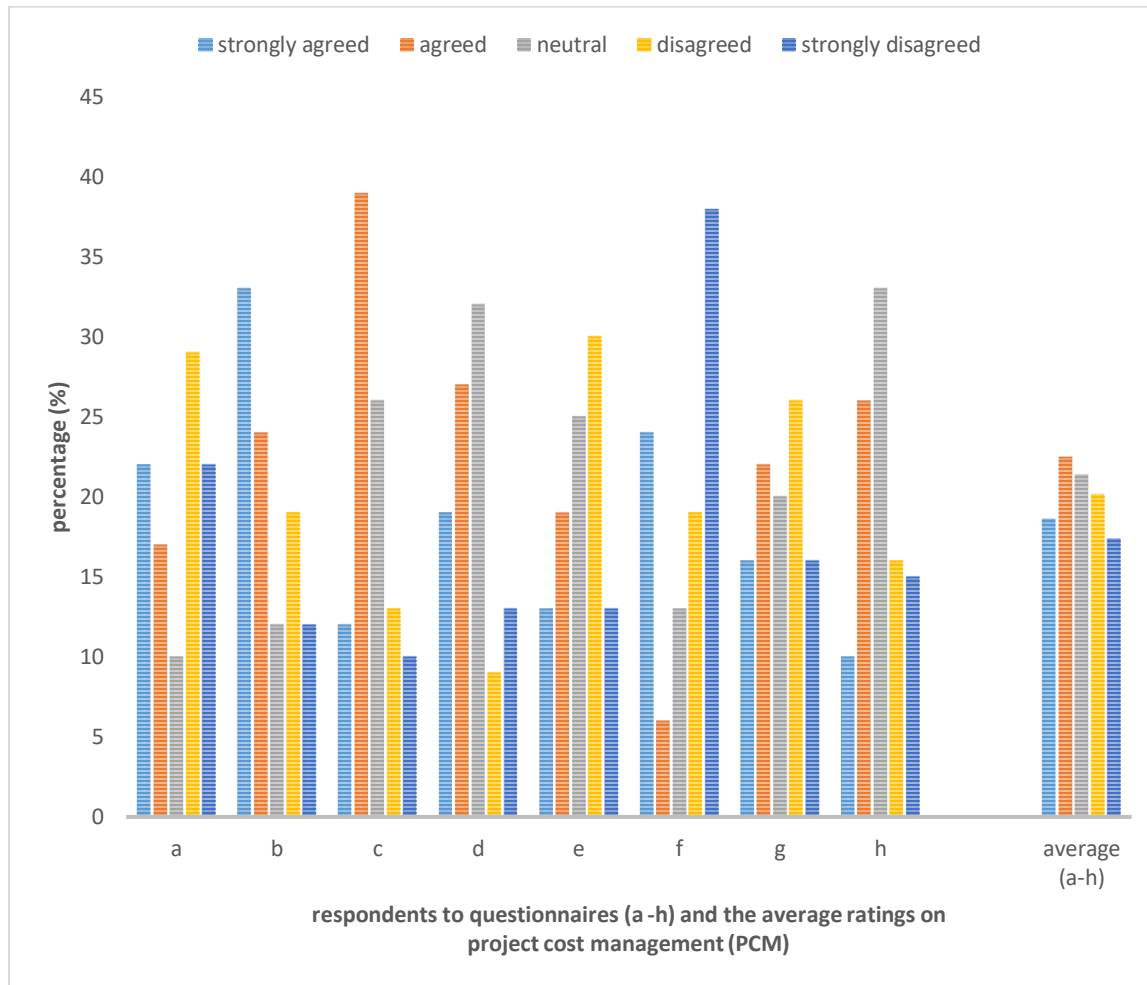
Table 4.8: Respondents of Project Cost management (PCM) rating at respondent rate (RR)

		Respondent Rate (RR)										Total Respondent (TR)	
	Entities	Strongly Agree)		Agree		neutral		disagree		Strongly disagree		Respondent (Nos) & (%)	
Nos	Questionnaire on; Project Cost Management (PMC)	Nos	%	Nos	%	Nos	%	Nos	%	Nos	%	Nos	%
a.	There is cost planning of the projects to ensure sustainability of roads construction projects	15	22%	12	17%	7	10%	20	29%	15	22%	69	100%
b.	Optimization of cost estimates for all resources is done on time	23	33%	17	24%	8	12%	13	19%	8	12%	69	100%
c.	Budgeting for all cost estimation is done on time and funds are released	8	12%	27	39%	18	26%	9	13%	7	10%	69	100%
d.	No cost overruns in company projects	13	19%	19	27%	22	32%	6	9%	9	13%	69	100%
e.	The contractor have cost control department	9	13%	13	19%	17	25%	21	30%	9	13%	69	100%
f.	Cost budgeting involve all department in the company	17	24%	4	6%	9	13%	13	19%	26	38%	69	100%
g.	Cost estimation is done on time and funds are released on time	11	16%	15	22%	14	20%	18	26%	11	16%	69	100%
h.	There is control of expenses	7	10%	18	26%	23	33%	11	16%	10	15%	69	100%

	optimization.												
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Author (2017)

Figure 4.8: Respondents of Project Cost management (PCM) rating at respondent rate (RR)



Author (2017)

Table 4.8 and figure 4.8 shown above indicate that on average from questionnaire (a to h), 18.63% of the respondents strongly agreed, 22.5% agreed, 21.38% were Neutral, 20.13% Disagreed while 17.37 % strongly disagreed. Therefore, majority of the respondents agreed with the eight questionnaires, meaning that the respondents agreed on some questionnaire on project quality management (PQM) from respondents (a to h).

4.2.9 Respondents on Project Quality Management (PQM)

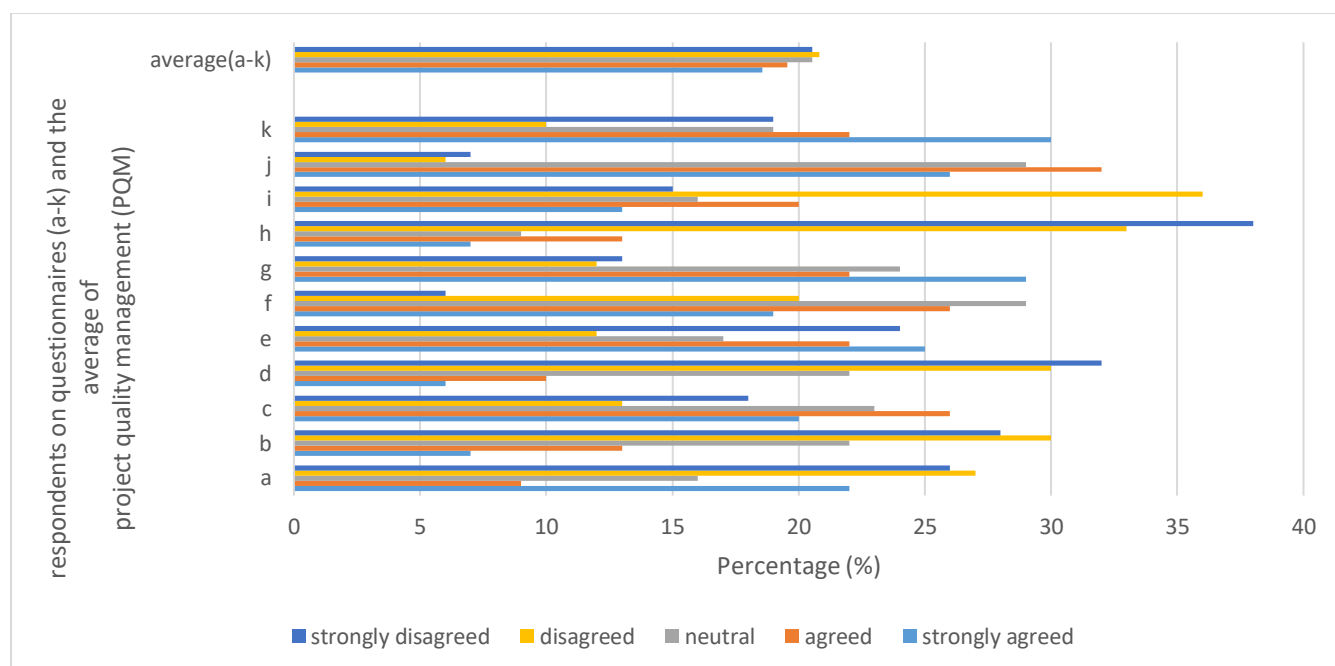
Table 4.9: Respondents of Project Quality Management (PQM) rating at respondent rate (RR)

		Respondent Reaction Rate (RRR)										Total Respondent (TR)	
	Entities	Strongly Agree)		Agree		neutral		disagree		Strongly disagree		Respondent (%) & Nos	
Nos	Questionnaire on; Project Quality Management(PQM)	Nos	%	Nos	%	Nos	%	Nos	%	Nos	%	Nos	%
a	There is enough quality planning conducted before projects start and all Stakeholders are involved.	15	22%	6	9%	11	16%	19	27%	18	26%	69	100%
b	Procedure and processes are validated before projects begin	5	7%	9	13%	15	22%	21	30%	19	28%	69	100%
c	There are measures to quality inspect and verification of the objectives	14	20%	18	26%	16	23%	9	13%	12	18%	69	100%
d	Clients are involved in the planning and reviewing of projects	4	6%	7	10%	15	22%	21	30%	22	32%	69	100%
e	The contractor carry out periodic quality control to enhance sustainability	17	25%	15	22%	12	17%	8	12%	17	24%	69	100%
f	The contractor have quality	13	19%	18	26%	20	29%	14	20%	4	6%	69	100%

	assurance department												
g	There is quality planning department of projects by the contractor	20	29%	15	22%	17	24%	8	12%	9	13%	69	100%
h	No issue with quality of works as far as customer satisfaction is concerned	5	7%	9	13%	6	9%	23	33%	26	38%	69	100%
i	The quality continues Improvement of team as the company ensures sustainability	9	13%	14	20%	11	16%	25	36%	10	15%	69	100%
j	Quality assurance guarantees sustainability of road construction projects	18	26%	22	32%	20	29%	4	6%	5	7%	69	100%
k	New ideas that have been verified are used to improve and enhance quality of projects	21	30%	15	22%	13	19%	7	10%	13	19%	69	100%
	average		18.55%		19.5%		20.54%		20.82%		20.54%		100%

Author (2017)

Figure 4.9: Respondents of Project Quality Management (PQM) rating at respondent rate (RR)



Author (2017)

Table 4.9 and figure 4.9 shown above indicate that on average from questionnaire (a to K), 18.55% of the respondents strongly agreed, 19.55% agreed, 20.54% were Neutral, 20.82% Disagreed while 20.54 % strongly disagreed. Therefore, majority of the respondents disagreed with the eleven questionnaires, meaning that the respondents disagreed on some questionnaire on project quality management (PQM) from respondents (a to k). On the same note, most of the respondents balanced on neutrality and strongly disagreed on project quality management (PQM)

4.2.10 Respondents of Project Timelines Management (PTM)

Table 4.10: Respondents of Project Timelines Management (PTM) rating at respondent rate (RR)

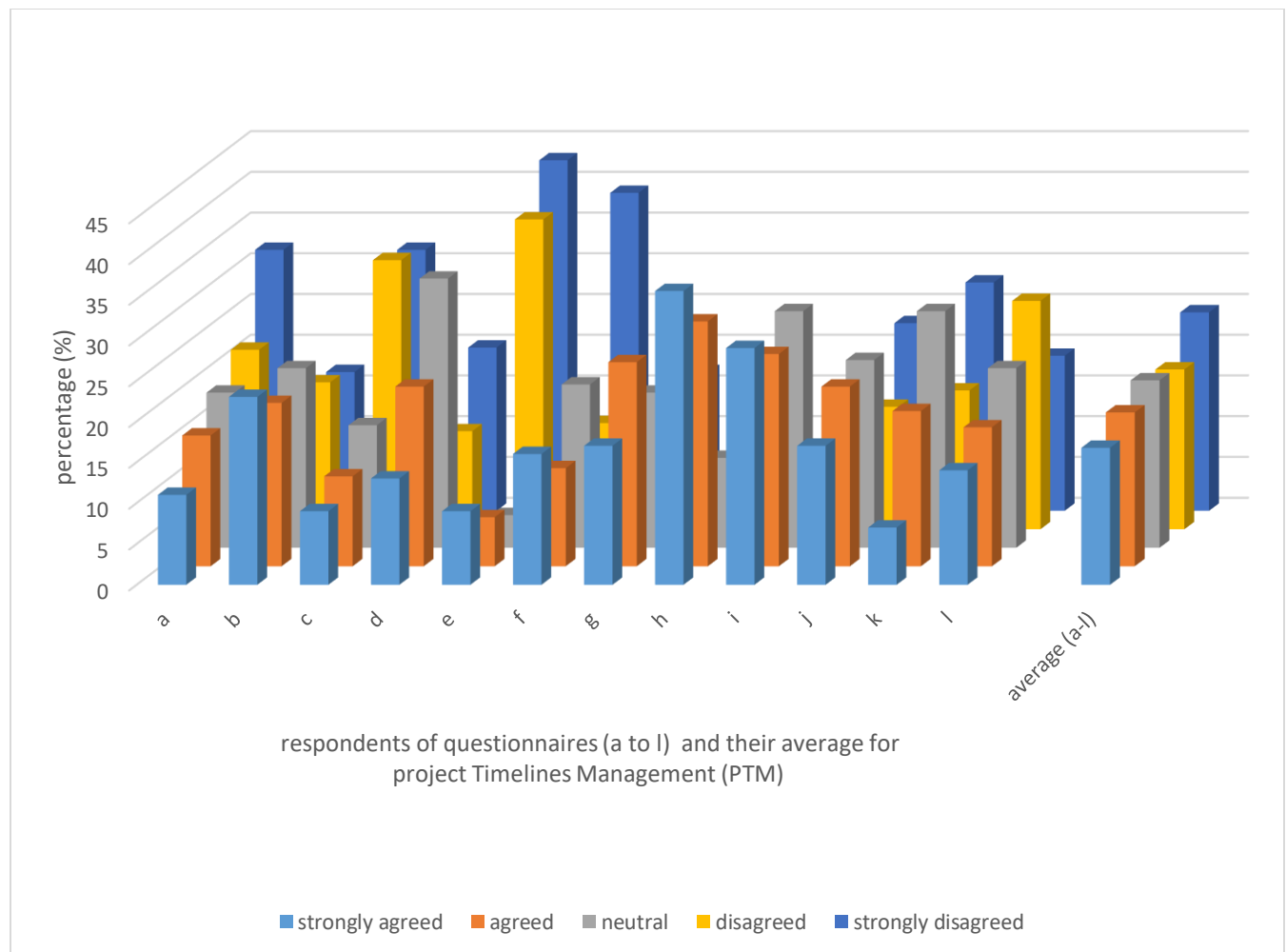
		Respondent Reaction Rate (RRR)										Total Respondent (TR)	
	Entities	Strongly Agree)		Agree		neutral		disagree		Strongly disagree		Respondent (%) & Nos	
Nos	Questionnaire on; Project Timelines Management(PTM)	Nos	%	Nos	%	Nos	%	Nos	%	Nos	%	Nos	%

a	The project frameworks of timelines are structured on time	8	11%	11	16%	13	19%	15	22%	22	32%	69	100%
b	There are meetings to discuss the timelines of projects and how they will be achieved	16	23%	14	20%	15	22%	12	18%	12	17%	69	100%
c	The acquisition of materials and equipment is timely	6	9%	8	11%	10	15%	23	33%	22	32%	69	100%
d	The contractor have project timeline flow chart at the office to guide timelines of works	9	13%	15	22%	23	33%	8	12%	14	20%	69	100%
e	The company have project timeline management department	6	9%	4	6%	3	4%	26	38%	30	43%	69	100%
f	Activities and tasks are allocated the required timelines each or in dependence	11	16%	8	12%	14	20%	9	13%	27	39%	69	100%
g	Projects are completed within the stipulated time	12	17%	17	25%	13	19%	15	22%	12	17%	69	100%
h	The company use work breakdown structure and allocate different timelines	25	36%	21	30%	8	11%	7	10%	9	13%	69	100%
i	estimate of activity duration is done on time on each task	20	29%	18	26%	20	29%	5	7%	6	9%	69	100%
j	Enough time is allocated for the tasks to be complete	12	17%	15	22%	16	23%	10	15%	16	23%	69	100%
k	Milestones are identified as flag for the next phased on time	5	7%	13	19%	20	29%	12	17%	19	28%	69	100%
l	Time schedules for the project are created on time	10	14%	12	17%	15	22%	19	28%	13	19%	69	100%

	average		16.75%		18.81%		20.51%		19.58%		24.33%		100%
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Author (2017)

Figure 4.10: Respondents of Project Timelines Management (PTM) rating at respondent rate (RR)



Author (2017)

Table 4.10 and figure 4.10 shown above indicate that on average from questionnaire (a to L), 16.75% of the respondents strongly agreed, 18.83% agreed, 20.51% were Neutral, 19.58% Disagreed while 24.33 % strongly disagreed. Therefore, majority of the respondents were strongly disagreed with the twelve questionnaires, meaning that the respondents were strongly disagreed on some questionnaire on project Timelines management from respondents (a to L)

4.2.11 Respondents of Project Deliverables Management (PDM)

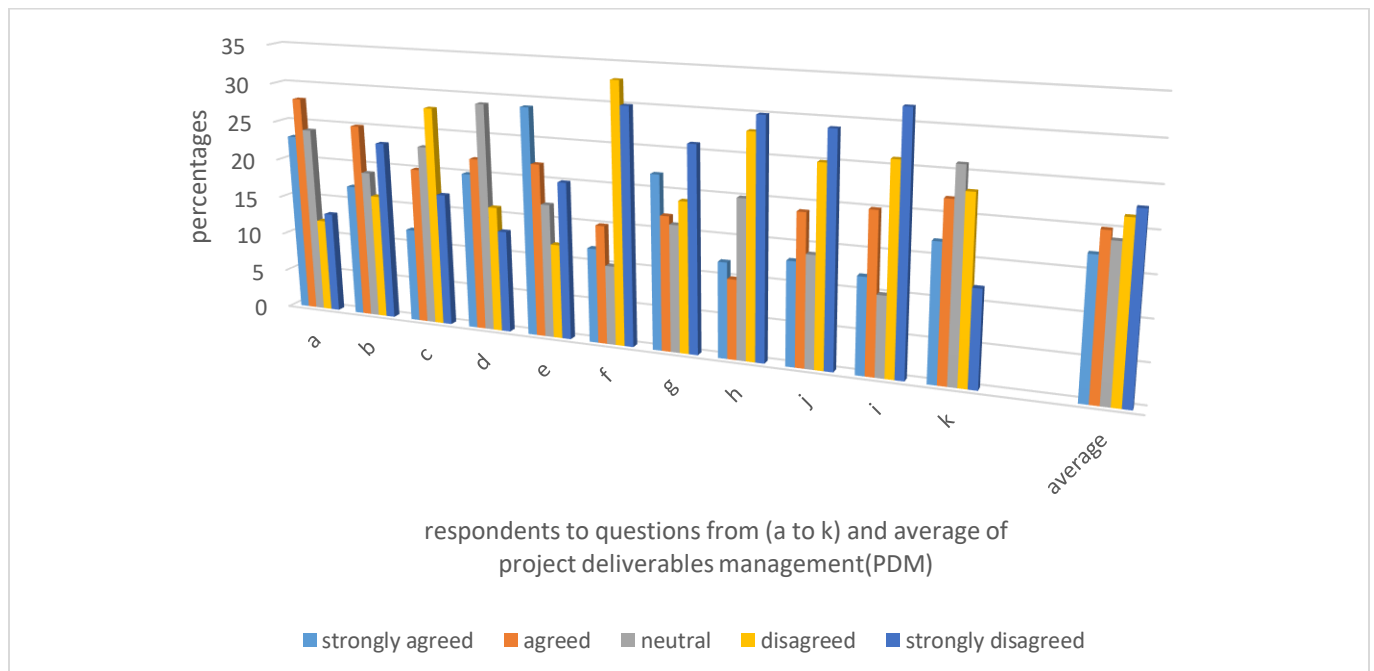
Table 4.11: Respondents of Project Deliverables Management (PDM) rating at respondent rate (RR)

		Respondent Reaction Rate (RRR)										Total Respondent (TR)	
	Entities	Strongly Agree)		Agree		neutral		disagree		Strongly disagree		Respondent (%) & Nos	
Nos	Questionnaire on; Project Deliverables Management(PDM)	Nos	%	Nos	%	Nos	%	Nos	%	Nos	%	Nos	%
a	The project frameworks of deliverables are structured on goals	16	23%	19	28%	17	24%	8	12%	9	13%	69	100%
b	There are meetings to discuss the deliverables on how they will be achieved	12	17%	17	25%	13	19%	11	16%	16	23%	69	100%
c	The acquisition of materials and equipment is done in pursuance to required deliverables	8	12%	14	20%	16	23%	19	28%	12	17%	69	100%
d	The project objects and goals are to be achieved as deliverables	14	20%	15	22%	20	29%	11	16%	9	13%	69	100%
e	The contractor use (S.M.A.R.T) to achieve is deliverables	20	29%	15	22%	12	17%	8	12%	14	20%	69	100%
f	Sustainability is obtained by having the right deliverables	8	12%	10	15%	7	10%	23	33%	21	30%	69	100%
g	Deliverables are completed within the set targets to ensure sustainability	15	22%	12	17%	11	16%	13	19%	18	26%	69	100%

h	Action plans are created for each deliverable and the people to deliver them	8	12%	7	10%	14	20%	19	28%	21	30%	69	100%
i	Vision and Mission statement achieves deliverables of the project the project	9	13%	13	19%	10	14%	17	25%	20	29%	69	100%
j	All stakeholders are involved in determining the benefits of all deliverables of the project	8	12%	14	20%	7	10%	18	26%	22	32%	69	100%
k	The contractor have project deliverables department for planning and sustainability	12	17%	15	22%	18	26%	16	23%	8	12%	69	100%
	average		17.18%		20.0%		18.9%		21.64%		22.72%		100%

Author (2017)

Figure 4.11: Respondents of Project Deliverables Management (PDM) rating at respondent rate (RR)



Author (2017)

Table 4.11 and figure 4.11 shown above indicate that on average from questionnaires (a to K), 17.18% of the respondents strongly agreed, 20.00% agreed, 18.9% were Neutral, 21.62% Disagreed while 22.70 % strongly disagreed. Therefore, majority of the respondents were strongly disagreed with the eleven questionnaires, meaning that the respondents were strongly disagreed on some questionnaire on project deliverables management from respondents (a to k)

4.2.12 Respondents on Project Evaluation Management (PEM)

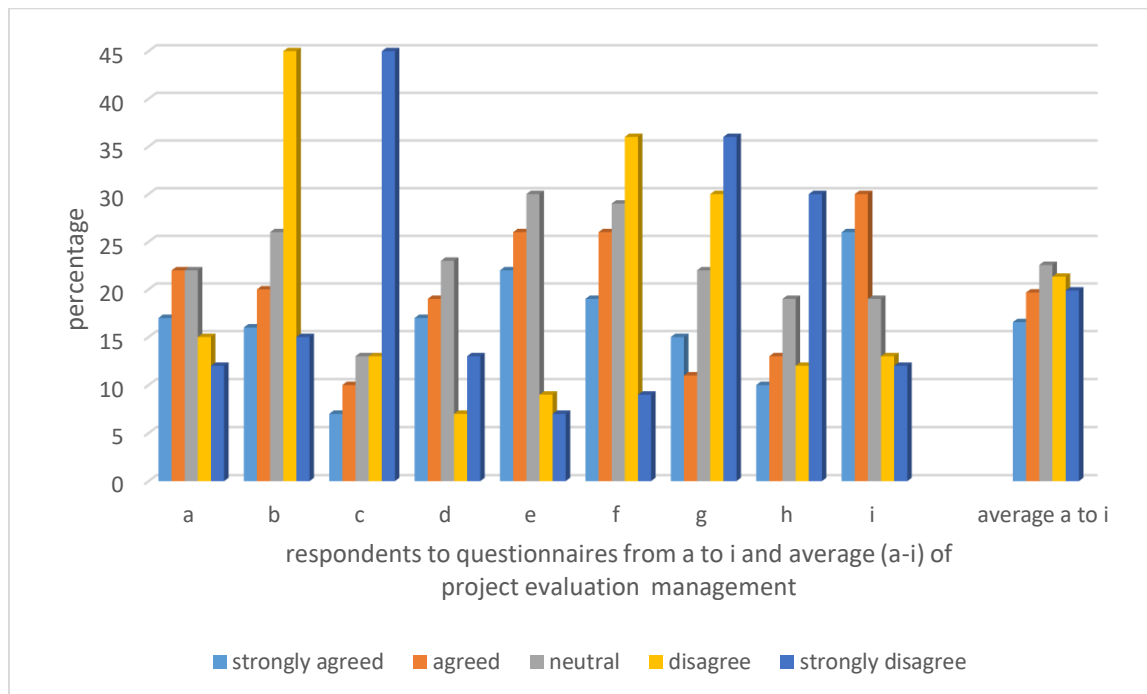
Table 4.12: Respondents of Project Evaluation Management (PEM) rating at respondent Reaction rate (RRR)

		Respondent Reaction Rate (RRR)										Total Respondent (TR)	
	Entities	Strongly Agree)		Agree		neutral		disagree		Strongly disagree		Respondent (%) & Nos	
Nos	Questionnaire on; Project Evaluation Management(PEM)	Nos	%	Nos	%	Nos	%	Nos	%	Nos	%	Nos	%
a	Monitoring is conducted on every operation and phase of the project	12	17%	15	22%	15	22%	19	27%	8	12%	69	100%
b	Evaluation is conducted in all relevant steps of the construction projects	11	16%	14	20%	18	26%	16	23%	10	15%	69	100%
c	Financial processes are audited and communication done across the company	5	7%	7	10%	9	13%	17	25%	31	45%	69	100%
d	The project operations are audited and rectification done through the processes	12	17%	13	19%	16	23%	19	28%	9	13%	69	100%
e	Monitoring ensures sustainability of projects	15	22%	18	26%	21	30%	10	15%	5	7%	69	100%

f	Evaluation brings impacts and relevance to projects	13	19%	18	26%	20	29%	12	17%	6	9%	69	100%
g	Evaluation help to compare targets and actual goals in a project	10	15%	8	11%	16	22%	11	16%	25	36%	69	100%
h	Evaluation is done on operation and in management of projects	7	10%	9	13%	13	19%	19	28%	21	30%	69	100%
i	Auditing helps to improve on sustainability of road construction projects	18	26%	21	30%	13	19%	9	13%	8	12%	69	100%
	average		16.56%		19.6%		22.56%		21.33%		19.88%		100%

Author (2017)

Figure 4.12: Respondents of Project Evaluation Management (PEM) rating at respondent Reaction rate (RRR)



Author (2017)

Table 4.12 and figure 4.12 shown above indicate that on average from questionnaire (a to j), 16.56% of the respondents strongly agreed, 19.67% agreed, 22.56% were Neutral, 21.33% Disagreed while 19.88 % strongly disagreed. Therefore, majority of the respondents were neutral with the nine questionnaires, meaning that the respondents were balanced on most questionnaire on project evaluation management from respondents (a to i)

4.2.13 How Does Project Planning (PP) influence sustainability on road construction projects

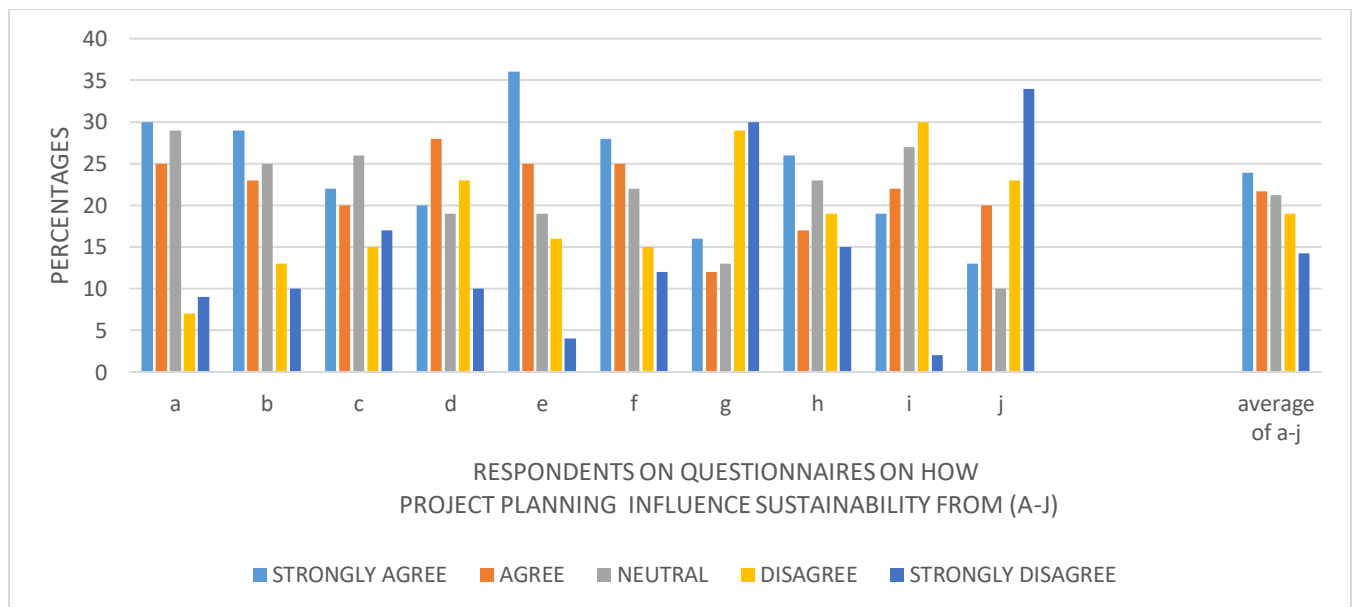
Table 4.13: Respondents of; How Does Project Planning (PP) influence sustainability on road construction projects rating at Respondent Reaction Rate (RRR)

		Respondent Reaction Rate (RRR)										Total Respondent (TR)	
	Entities	Strongly Agree)		Agree		neutral		disagree		Strongly disagree		Respondent (%) & Nos	
Nos	Questionnaire on; Project Evaluation Management(PEM)	Nos	%	Nos	%	Nos	%	Nos	%	Nos	%	Nos	%
a	Project planning is a key component on sustainability	21	30%	17	25%	20	29%	5	7%	6	9%	69	100%
b	Project planning have long term benefits	20	29%	16	23%	17	25%	9	13%	7	10%	69	100%
c	There is risk of not carrying out project planning	15	22%	14	20%	18	26%	10	15%	12	17%	69	100%
d	project planning is carried out before start of project	14	20%	19	28%	13	19%	16	23%	7	10%	69	100%
e	Project planning influences sustainability	25	36%	17	25%	13	19%	11	16%	3	4%	69	100%
f	Project planning helps in completing a project within time	19	28%	17	25%	15	22%	10	15%	8	12%	69	100%

g	Project planning helps project with costing	11	16%	8	12%	9	13%	20	29%	21	30%	69	100%
h	Project planning improves on quality of projects	18	26%	12	17%	16	23%	13	19%	10	15%	69	100%
i	Project planning helps in achieving the deliverables of the project	13	19%	15	22%	19	27%	21	30%	1	2%	69	100%
j	Project planning helps in evaluating road construction projects	9	13%	14	20%	7	10%	16	23%	23	34%	69	100%
	AVERAGE		23.9%		21.7		21.2%		19.0%		14.2%		100%

Author (2017)

Figure 4.13: Respondents of; How Does Project Planning (PP) influence sustainability on road construction projects rating at Respondent Reaction Rate (RRR)



Author (2017)

Table 4.13 and figure 4.13 shown above indicate that on average from questionnaire (a to j), 23.9% of the respondents strongly agreed, 21.7% agreed, 21.2% were Neutral, 19.0% Disagreed while 14.2 % strongly disagreed. Therefore, majority agreed with the ten questionnaires, meaning that the respondents were realistic that project planning influence sustainability.

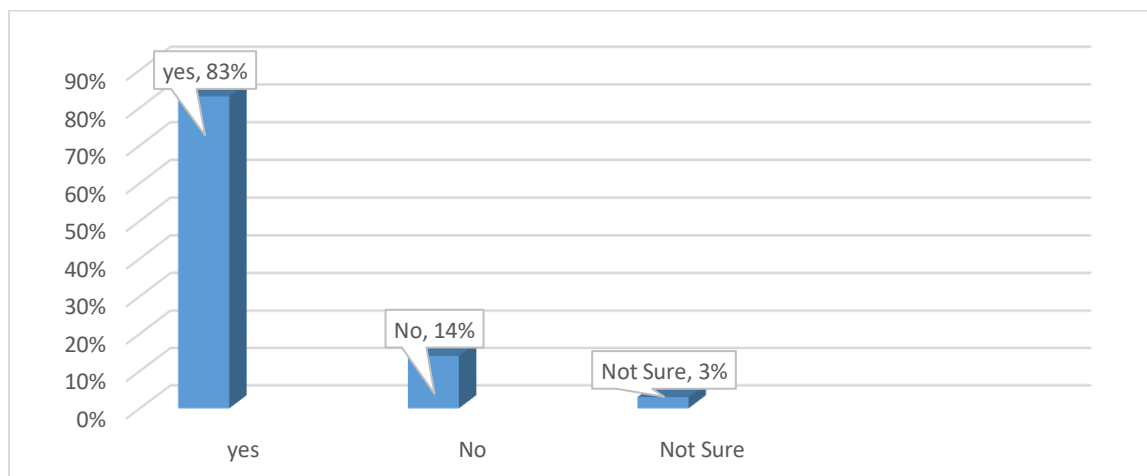
4.2.14 The benefits of sustainability in a project are Long term;

Table 4.14: Respondents of; the benefits of sustainability in a project are Long term; rating at respondent rate (RR)

Benefits of sustainability Of a project are long term	No. of Respondents	Percentage
yes	57	83%
No	10	14%
undecided	2	3%
Total	69	100%

Author (2017)

Figure 4.14: Respondents of; the benefits of sustainability in a project are Long term; rating at respondent rate (RR)



Author (2017)

Table 4.14 and figure 4.14 shown above indicate that, 83% of the respondents said yes, 14% said no, while 3% said they were not sure. Therefore, majority said yes, meaning that the respondents were real that benefits of sustainability are long term.

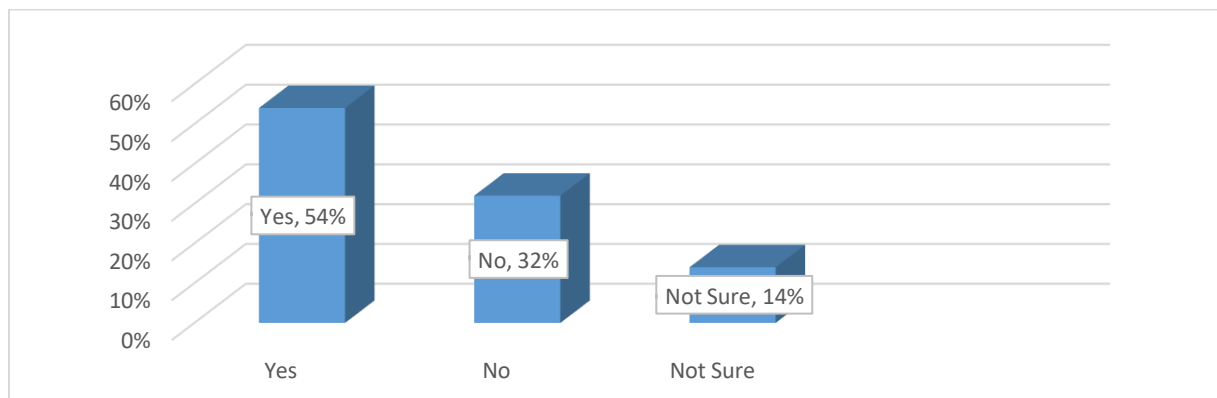
4.2.15 sustainability of road construction project is achieved through project planning management

Table 4.15: Respondents of; sustainability of road construction project is achieved through project planning; Rating at respondent rate (RR)

Sustainability of road construction projects is achieved through project planning	No. of Respondents	Percentage
yes	37	54%
No	22	32%
Not sure	10	14%
Total	69	100%

Author (2017)

Figure 4.15: Respondents of; sustainability of road construction project is achieved through project planning; Rating at respondent rate (RR)



Author (2017)

Table 4.15 and figure 4.15 shown above indicate that, 54% of the respondents said yes, 32% said no, while 14% said they were not sure. Therefore, majority said yes, meaning that the respondents were accurate that sustainability of road construction project is achieved through project planning management.

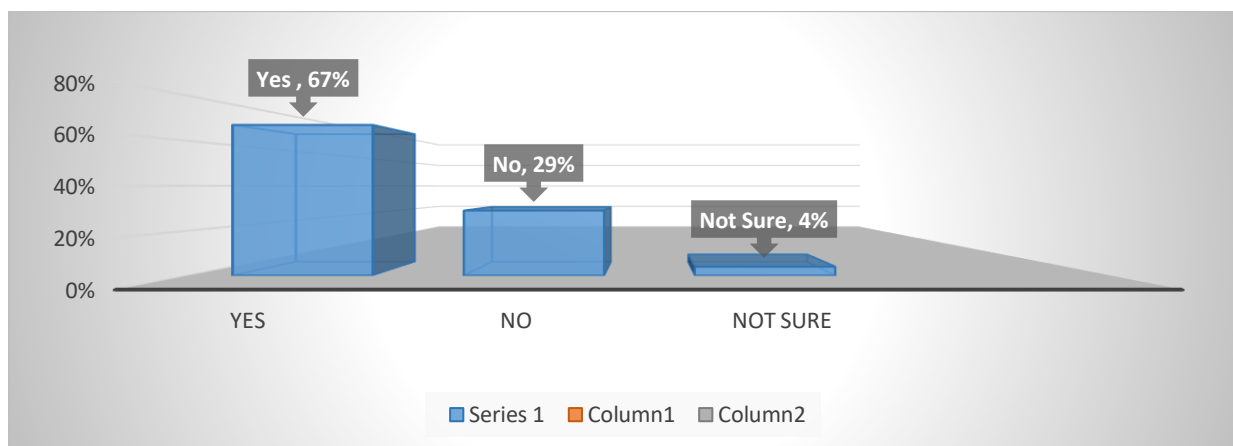
4.2. 16 project planning is done before start of project;

Table 4.16: Respondents of; Project Planning is done before start of Project; Rating at respondent rate (RR)

Project planning is done before start of project	No. of Respondents	Percentage
yes	46	67%
No	20	29%
Not sure	3	4%
Total	69	100%

Author (2017)

Figure 4.16: Respondents of Project Planning is done before start of Project; Rating at respondent rate (RR)



Author (2017)

Table 4.16 and figure 4.16 shown above indicate that, 67% of the respondents said yes, 29% said no, while 4% said they were not sure. Therefore, majority said yes, meaning that the respondents were right that project planning is always done at start of project.

4.2.17 Lack of project planning contributes to Unsustainability of road construction projects

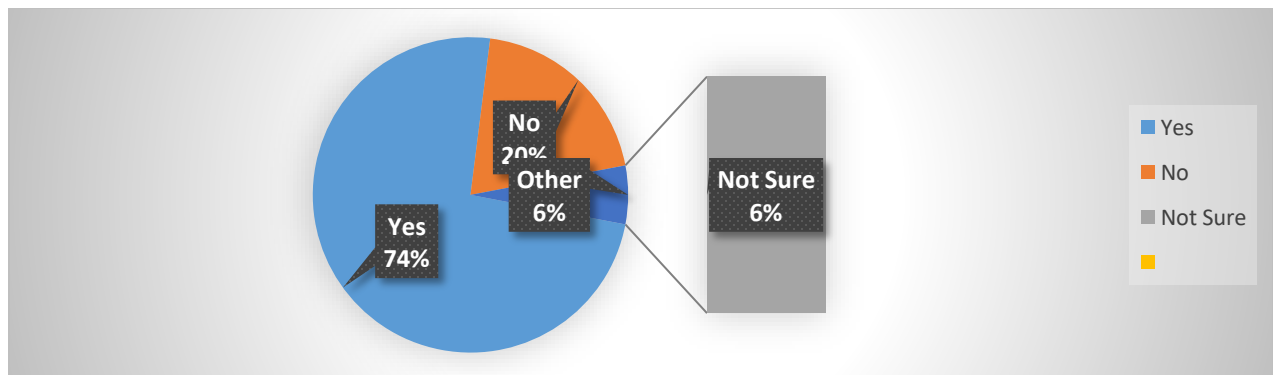
Table 4.17: Respondents of; Lack of project planning contributes to Unsustainability of road construction projects

; Rating at respondent rate (RR)

Lack of project planning contributes to unsustainability of road construction projects	No. of Respondents	Percentage
yes	51	74%
No	13	20%
Not sure	4	6%
Total	69	100%

Author (2017)

Figure 4.17: Respondents of; Lack of project planning contributes to Unsustainability of road construction projects; Rating at respondent rate (RR)



Author (2017)

Table 4.17 and figure 4.17 shown above indicate that 74% of the respondents said yes, 20% said no, while 6% said they were not sure. Therefore, majority said yes, meaning that the respondents were right that lack of project planning contribute to unsustainability of road construction projects.

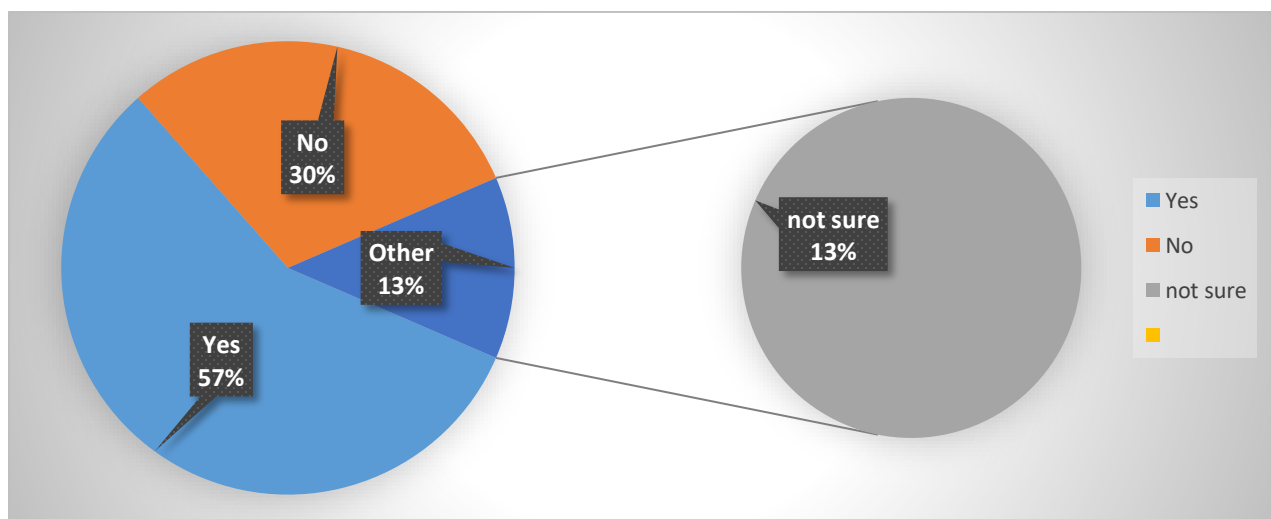
4.2.18 The person who prepare project planning is a Project planner

Table 4.18: Respondents of; the person who prepare project planning is a Project planner; Rating at respondent rate (RR)

Who do project planning is a project planner	No. of Respondents	Percentage
yes	39	57%
No	21	30%
Not sure	9	13%
Total	69	100%

Author (2017)

Figure 4.18: Respondents of; the person who prepare project planning is a Project planner?; Rating at respondent rate (RR)



Author (2017)

As indicated in Table 4.18 and figure 4.18 shown above, specify that 57% of the respondents said yes, 30% said no, while 13% said they were not sure. Therefore, majority said yes, meaning that the respondents were accurate that project planner do carry out project planning in a project.

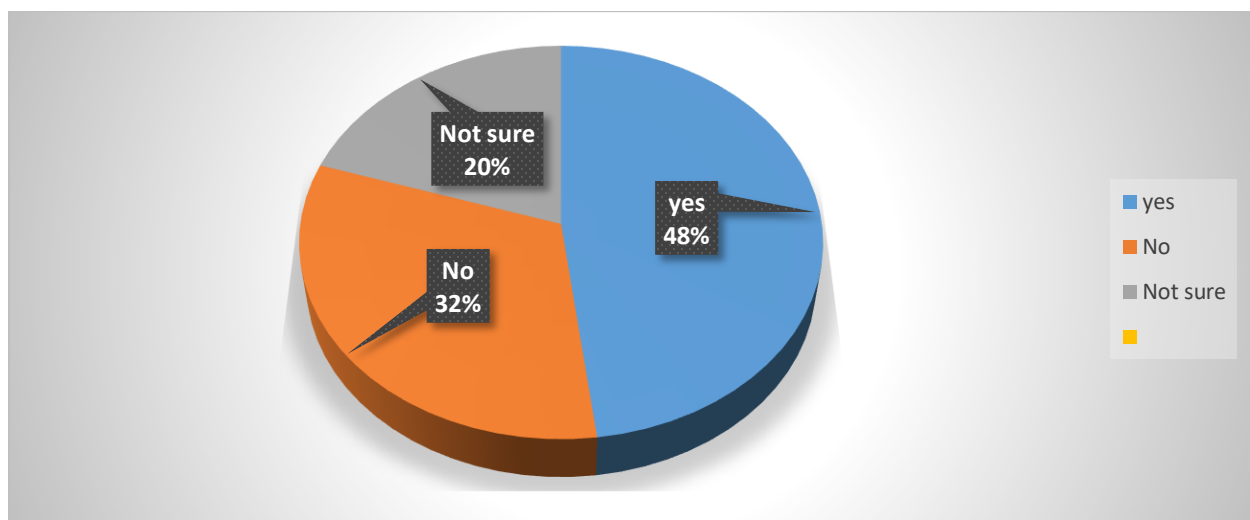
4.2.19 Should Project Planning be a continuous process?

Table 4.19: Respondents of; should project planning be a continuous process? Rating at respondent rate (RR)

Should project planning be a continuous process?	No. of Respondents	Percentage
yes	33	48%
No	22	32%
Not sure	14	20%
Total	69	100%

Author (2017)

Figure 4.19: Respondents of; should project planning be a continuous process? Rating at respondent rate (RR)



Author (2017)

Table 4.19 and figure 4.19 shown above indicate that 48% of the respondents said yes, 32% said no, while 20% said they were not sure. Therefore, majority said yes, meaning that the respondents were in agreement that Project planning should be a continuous process.

4.2.20 what to do to safeguard sustainability of road construction projects in Kenya is to ensure project planning of projects in the country; rating at respondent rate (RR),

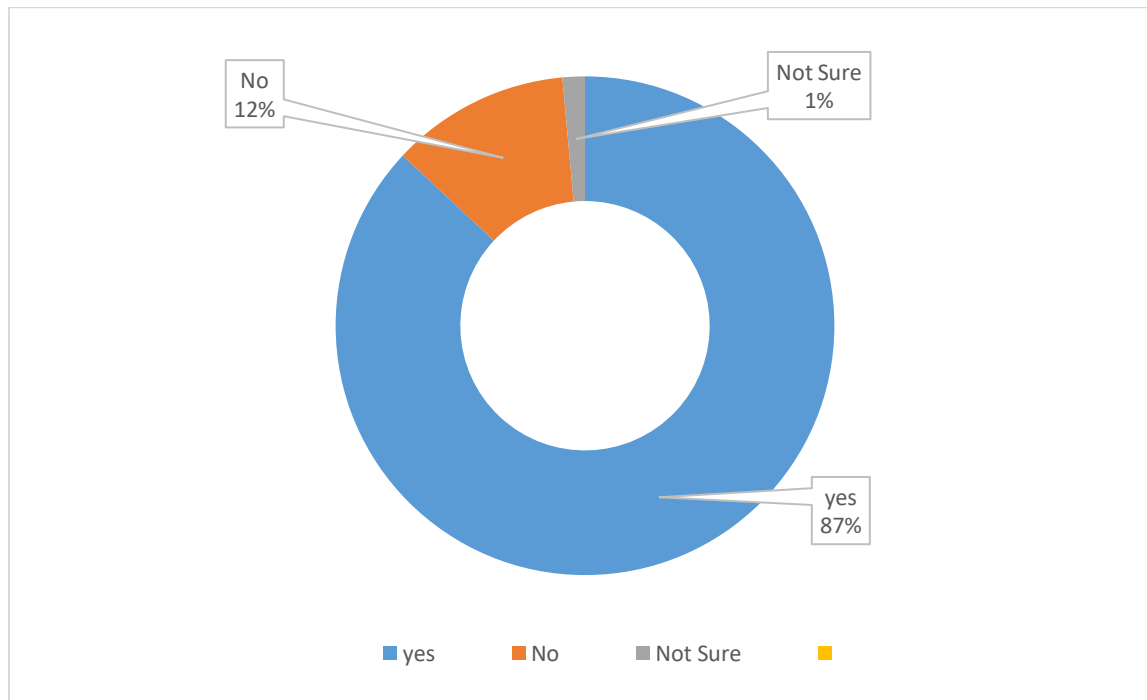
The Researcher had requested the Respondents to indicate of what to do to ensure sustainability of road construction projects in Kenya? To ensure project planning of projects the country need to enhance project planning management; rating at respondent rate (RR), and the table below shows the results obtained by the researcher.

Table 4.20: what to do to safeguard sustainability of road construction projects in Kenya is to ensure project planning of projects in the country; rating at respondent rate (RR)

To ensure project planning of projects the country need enhance project planning management	No. of Respondents	Percentage
yes	60	87%
No	8	12%
Not sure	1	2%
Total	69	100%

Author (2017)

Figure 4.20: what to do to safeguard sustainability of road construction projects in Kenya is to ensure project planning of projects in the country; rating at respondent rate (RR)



Author (2017)

As indicated in table 4.20 and figure 4.20 above, 87% of the respondents said yes, 12% said No, while 2% said they were not sure. This show that majority of the respondents said Yes, That means, to ensure project planning of projects, the country need to enhance project planning management

4.3 Summary of the Analysis

This chapter has summarized and clearly presented the data that was collected. It has been presented by the use of charts and tables. The raw data that was collected during the study has been given meaning and therefore conclusions were easily made from the study. This chapter covered all areas highlighted in the objectives and the results were clearly presented.

CHAPTER FIVE

SUMMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS.

5.1 Introduction

The chapter presents the research findings; it also provides a detailed conclusion of the finding of the study. More so it gives the recommendations necessary for effective project planning on sustainability of road construction projects. Finally, the chapter proposes further research dimensions within a framework of project planning on sustainability of road construction projects.

5.2 Summary of the findings

The study questionnaire response rate stood at 70% success with only 30% unsuccessful questionnaires which attributed to the researcher as the unwillingness to attend to the questionnaires, being committed to their tasks which made them lack enough time to attend to the questionnaires or some might have not been present when the questionnaires were being collected. The research was based basically on demographic information that was based on gender, marital status and age. Then male gender of respondents dominated the research questionnaires at 67% and the female respondents stood at 33%. Regarding the marital statuses of the respondents, the researcher identified that 90% of the respondents were married, 7% were single while 3% were separated. There were no divorced or windowed respondents from the study carried out.

Different age categories were also identified during the research. The age ranged between different classes. The age ranged from 18 to 35 years. 4 respondents ranged between 18 to 23 years which represented 6% of the respondents. 36% of the respondents ranged between 24 to 29 years which constituted 24 of the total respondents and lastly 58% of the respondents ranged between 30 to 35 years of age. This indicates that the company has a relatively young age that gets involved in the tasks of the company.

From the study, the researcher identified different education levels of the respondents. The different levels were master's degree, bachelor's degree, diploma, O-level certificate and A-level certificate. The master's degree had 15 respondents representing 22% of the respondents. The

bachelor's degree level had 32 respondents that represented 48% of the respondents. The diploma level had 16 respondents. This represented 24% of the respondents. The O-level certificate level had no respondents while the A-level had 4 respondents' representing 6% of the total respondents.

The researcher also identified other specialist form of training in planning or management as responded by the respondents. 21 respondents with Master's Degree had special training in management and/or planning. This represented 31% of the respondents. More so, 7 respondents with Bachelor's Degree also had special training in management and/or training. This represented 10% of the respondents. Lastly 4 respondents with Diploma also had special training in management and/or planning representing 6% of the respondents.

The researcher identified that majority of the respondents representing 83% agreed that the benefits of sustainability are long-term. Only a representation of 14% disagreed. A small portion of 3% of the respondents were not sure if the benefits of sustainability are long term. The respondents had a 54% response when they stated that sustainability of road construction projects is achieved through project planning. 32% of the respondents varied and 14% were not sure. The research also revealed that lack of project planning contribute to unsustainability of road construction projects and 74% of the respondents concurred with the researcher and 20% only differed and 6% were not sure.

The respondents also rated the project planner as the person who do project planning on sustainability of road construction projects within the company. 57% of the respondents agreed while the rest 30% of respondents contrasted and 13% were not sure. More so, the researcher also identified that most of the respondents of 48% agreed that the company has to ensure sustainability of road construction projects by creating a culture of continuous process of project planning and only 32% contrasted and 20% were not definite. Most of the respondents provided 87% response that the country need to enhance sustainability on road construction projects by ensuring project planning and only 12% diverged and 2% were not certain.

5.2.1 Role of Project Cost Management on Sustainability of Road Construction Projects

The researcher found that project cost management is very essential in determining the key performance indicator of a company. It was found that managing project cost management as elaborated in cost planning, cost control, cost estimation and cost budgeting is key factor in ensuring sustainability on road construction projects. Project Cost management is effective in differentiating actual costs from planned costs. Actual outcomes are equated in contrast to planned costs and if the actual cost is high, the management takes actions to ensure projects are completed within cost and no cost overruns to ensure long term sustainability of road construction projects as (Rad P.F, 2002).

Cost budgeting is also important as found by the researcher since it gives a baseline by which real expenditure and the foreseen ultimate costs of the projects are provided. The research established that assessing expenses can either be comparative or parametric. The researcher found that cost estimation is vital in managing costs in a project and ensure sustainability on road construction projects. This is because it provides a distinct overall value with some having constituent values. According to the research, cost estimations are made possible by breaking down a projects total scope into convenient parts thus it enables resource assigning and costing. Work Breakdown Structures, Cost Breakdown Structure are ways of cost budgeting that the researcher found during the research that can be used to break down project cost management as described by (Kathy Schwalbe, 2014).

Resource planning was also found to be an effective project cost management strategy. The researcher found that it is useful in identifying the overall resources required for completing the project successfully. Exploiting the resource plan exhaustively, the individual is able to identify the labor quantity, resources and equipment needed for delivering the project. A resource plan also gives the summary of the required resources for project completion are identified form the research. The research found that all respondents agreed unanimously that most of their projects are sustainable. Regarding the benefits resulting from project planning in a project, the research found that the respondents provided varied benefits of project planning in use using project cost management on sustainability of road construction projects.

5.2.2 Effects of Project Quality Management on Sustainability of Road Construction Projects

It was found that the company has put in place project quality management that is fully operational. Project quality management ensures that project tasks are operative and resourceful in respect to objectives purpose as well as performance of the project. The research found that quality planning is responsible for planning and describing the processes and the metrics that will be employed within the project. It also helps in ensuring that shareholders and other parties expectations of quality are acknowledged appropriately and sustainability of road construction projects (Rose, Kenneth H. July 2005).

The research established that the quality assurance is responsible for holding confidence within the hosting institution by ensuring that projects, selections and plans are managed appropriately to ensure sustainability of projects. More so, it is responsible for ensuring that the company is in possession of personnel with suitable skills and knowledge to enhance accountability (Paul H. Selden, 1998).

Additionally, the researcher found that quality control is involved in inspecting, testing and measuring the performance of the project. It is responsible for provision of verification and deliverables that conform to requirements of the projects as well as those of the clients. It provides the conclusion whether the accepted standards have been achieved or not as described by (Thareja P, 2008). The study established that quality customer satisfaction is necessary for a company performance and proper project planning through project quality management enhance quality customer satisfaction which then improves quality continual improvement to enhance sustainability on road construction projects necessary in meeting the client's requirements. Continual improvement is also necessary to ensure quality assertion as well as quality procedures are put in place in driving developments in competency and efficacy on sustainability of projects (Roberts Michael, 2012).

5.2.3 Effects of Project Timelines Management on Sustainability on Road Construction Projects

The researcher found that project timelines management are necessary on sustainability of road construction projects. Without them the project plans are incomplete. Project timelines management is responsible for delivering modest visual impressions of the project from the start to end. This helps in augmenting task proficiency amongst teams. Coming up with effective scope statement for the project provides a framework for the deliverables to be produced. It was found that creating a work breakdown structure is effective for better performance on tasks to enable meeting the projects timelines and ensure sustainability of road construction (Lakein Alan, 1973).

Determining task activities, task duration, task resources and dependencies for the project was also found to be effective and necessary to make sure that the timeline for the project becomes comparatively forthright. It was found that better results are realized when the task activities and resources dependencies are well mapped. Additionally, building a projects management timeline is vital for a project performance. It should be quantifiable and accurate. It helps in differentiating the uncompleted tasks from the completed ones. The study found that important milestone identification within a project is key for the performance of the project. Providing the progress from start to finish is made possible by the milestones. Resources availability is also vital for meeting timelines for projects. Without their availability, the timelines will not be met and hence sustainability on road construction projects will not be achieved in pursuance to (Partho, 2009).

5.2.4 Contribution of Project Deliverables Management on Sustainability of Road Construction Projects

The study shows that China Wuyi Company sets project deliverables management for the projects that they conduct. The goals are defined by specific objectives set by the project management for the different sections of the project. The operations are driven by the objectives of each phase. The specific objective is measurable by the project deliverables management from the tasks performed in the operational areas. The project deliverables management are responsible for reaching the objectives of the project in their sections of the operations as highlighted by (Cutting Thomas, 2009). The study shows that project deliverables management

makes systems and process with each other to make sure there is seamless flow of operations and functions to enhance sustainability on road construction projects. The project deliverables have long term goals which are long term description of the prospected achievement of the company thus it is broken down to smaller measurable entities which represents the objectives which are then allocated to the different managers and supervisors answerable to the project manager to ensure roles are shared and accounted for to enhance sustainability of road construction projects as described by (Kermit Burley, 2013).

The project deliverables management allocates schedule of the whole project to meet the customers' expectations and sticking to the budget. The deliverables are defined by the different types of goals they are representing and should be in (S.M.A.R.T.) form. For specific goals, the managers and supervisors of the project are all working towards meeting the general goal of the project which are broken down to measurable goals where numbers and measurement are prospected to be attained which then represent the attainable goals defining the measurements that can be achieve which are realistic. The attainable goals relevant and have a time bound of when it can be achieved through sustainability of road construction projects as expounded by (Bernie Roseke, 2015)

5.2.4 How Project Evaluation Management affect Sustainability of Road Construction Projects

The researcher found that the project evaluation management have been observed through the previous projects conducted in by the company. The processes in the construction are constantly monitored to make sure safety and regulations are observed to minimize accidents. Also the study indicated that the techniques and equipment are also monitored to ensure they are working efficiently to reduce downtime and delays in the middle of the project due to breaking down or faulty equipment. Project evaluation management is conducted to evaluate if the objective and the goals are met and to provide further guidelines to the project management to meeting the deadlines in time while achieving the desired deliverables of the project and maintain sustainability of road construction projects. Constant project evaluation management of the processes is conducted to avoid diverting from the main course of the project, evaluate the risks involved and different regulatory measured that can be adopted (Sarah Del Tufo, 2002).

The study also identified project evaluation management as a major productive action in the identification of various weaknesses in the procedures and systems that prevents efficiency and effectiveness. The deliverable and other outcomes are evaluated and monitored to ascertain their efficacy from the processes and if there could have been a different approach to achieve better results or equivalent at a shorter time and at cost effective and enhances sustainability of road construction projects. Like the adoption of building-specific methods for assessing and evaluating the project ensures that the regulations are followed and observed throughout the project period. The research identifies that the projects sets measurable and achievable targets which are used as basis for measuring the efficiency of the project to achieving its goals and sustainability (Freeman H.E, 2004).

The study also identified auditing has been conducted in the previous projects conducted by the organization. The most audits have been conducted are project management, operational and forensics audits. The project evaluation management audits have been conducted in phases to ensure big projects have been compromised along the stages and at the end of the projects to analyze what has happened and what can be done differently in the future projects to maximize on sustainability. Operational audits are conducted in most projects. Operational audits are efficient in the determining the practicability of the processes to achieving the objectives in time. Forensic audits also inducted in the accounts of to ensure there is transparency in the projects and that the resources are utilized efficiently as recommended by (Gilbert W. Joseph & Terry J. Engle, 2005).

5.3 Conclusion

The study established that the research respondents have an impeccable education level that has provided them with the necessary knowledge for project planning. It also established that the study response rate was very high which made it possible to carry out the research. The researcher also established that there exist many males than female personnel. Also established was that the company has a relatively young population of personnel who would be regarded as highly active.

On project cost management the researcher identified that it provides better competitive edge and it's the process of planning and controlling the budget of a business or a project through cost

control, cost planning, resource planning, cost estimation and cost budgeting. It can be concluded that the company's project is highly sustainable and that managers within the organization play a lot in budgeting. It concluded that clients get engaged in the activities of the company's projects to enable the company to meet its client's requirements and complete projects within the project cost estimates and avoid cost overruns that's increasing sustainability of road construction projects as defined by (P.M.P. Augsburg, 2012).

On project quality management, the researcher identified quality assurance, quality planning, quality control, quality customer satisfaction and quality continual improvements as key elements of project planning in ensuring sustainability of road construction projects. Project quality management guarantees that an organization's product or service is steady. Project Quality management is concerned with the means to achieve quality in its products and services. It therefore, employs quality assurance and control of processes as well as products to reach further consistent quality (Roberts Michael, 2012).

On project timelines management, the researcher established that the company was able to complete its projects within the set project timelines and increased its sustainability and project benefits. The researcher identified the process of managing timelines from the scope statement, to breaking activities to task, allocating duration and creating flow path and establish project timeline management to improve on sustainability. (Morgenstern Julie, 2004).

On project deliverables management, the study established that within the company, there exists good project deliverables management that have enhanced its better performance on project planning. Also, the study recognized that the company is very efficient in responding to issues raised in meetings held by the company on matters of delivering the project as planned and also ensure sustainability of road construction projects. It can be concluded that the company is very effective on its delivery of projects since majority of the projects have been completed based on planned goals and benefits (Kermit Burley, 2013)

On project evaluation management, the researcher established that the company carried out periodic operational and management evaluation through monitoring of impact, effectiveness and relevance. Auditing was also carried out periodically to ensure sustainability of road

construction projects was achieved though ensuring what is planned is what the final product was as per intended benefits (David Todd, 2007).

Lastly, it can be concluded that the company appreciates sustainability of road construction projects through proper project planning and would like to improve on project planning to improve on its project cost management, project quality management, project timelines management, project deliverables management and project evaluation management and ensure sustainability of road construction projects on long term, so as to benefit all stakeholders.

5.4 Recommendations

For the influence of project planning on sustainability of road construction projects to remain relevant in road construction companies and in particular the China WUYI Company Limited, based on the research findings of the study on the influence of project planning on sustainability of road construction projects at Nairobi City County in Kenya which was a case study of the WUYI Company Limited, the following were the are key recommendations proposed to counter challenges encountered during project planning on sustainability of road construction projects.

5.4.1 Project Cost Management

The study findings have shown that, when project cost management is well utilized during project planning road construction projects, chances are that there will be few cost overruns and the project will be completed within the set projects cost enhancing on sustainability of road construction projects the researcher recommends the Contractor to carry out effective project planning before the commencement of road construction project to ensure sustainability. China Wuyi should put in place relevant costing department to maximize cost control, resource planning, cost estimation and cost budgeting which are key elements of project cost management in project planning that enhance sustainability of road construction projects.

Moreover, project cost management should be employed for all road construction projects, as well as for the over-all business model. When project cost management is applied to a project, projects expected costs are calculated while the project is still in the initial planning period stages and are approved beforehand or before the commencement of the project. During all the project

implementation stages, all project costs and expenses are recorded and monitored to make sure they stay in line with the estimated or calculated initial project cost management plan. After the project is complete, the predicted costs and actual costs can be compared and analyzed effectively, creating efficient enabling environment for future project cost management predictions and budgets that sustains long term sustainability. This allows the contractor or the project manager to predict impending expenditures or expenses to help reduce the chances of going over budget or experiencing unnecessary cost overruns. This is achieved by implementing project cost management systems, processes and structures for projects and can support a business to keep overall budget under control, well estimated, and within the project cost management in the project planning on sustainability of road construction projects. Lastly the researcher recommends Project Cost Management of cost related activities to be achieved by collective collecting, estimation,, control, analyzing, evaluating, auditing and reporting cost information used for cost planning, cost budgeting, cost estimating, and cost control by carrying out project cost forecasting, and monitoring project costs and establishing a project cost management process to enhance sustainability of road construction projects.

5.4.2 Project Quality Management

The study findings indicate that project quality management is the key pillar in project planning that sustains sustainability of road construction projects. The researcher therefore recommends that project quality management use wide approved range of tools, methods and techniques for identifying, computing, measuring, prioritizing and improving processes and systems which are critical to project quality that management that enhance sustainability of road construction project through quality planning, quality assurance, quality control, quality continual improvement and quality customer satisfaction.

In addition, the researcher recommends the use of project quality management as a quality system or a quality culture that sets and coordinates activities to direct and control contractors, and business to continually improve the, competency, effectiveness, impact, efficiency and quality sustainability of its project quality management performance and to advance on quality customer satisfaction as their expectations inevitably drive and define project quality performance criteria and quality standards. Thus, project quality management should focus more on customer expectations and satisfaction through collection of quality processes and systems

focused on consistently meeting the customer requirements and enhancing their satisfaction as well as ongoing reviews and continuous project quality improvement to enhance sustainability of road construction projects.

5.4.3 Project Timelines Management

The study findings indicate that project timelines management act as the driver of project planning that safeguards sustainability of road construction projects by guaranteeing projects are completed within the set stipulated project timelines. The researcher recommends the use of project timelines management as a tool in the process of organizing and planning particularly, in distributing time between specific tasks and activities through work breakdown. This ensures the projects are completed within the set project timelines.

Furthermore, the researcher recommends use of tools to carry out effective project time management through establishing scope statement and activities, setting schedules and sequences, estimating duration and resources, then measuring flow chart that control schedules and build timeline management that certify sustainability on road construction projects. Project timeline management should be used to show time on specific scales on axis of projects, and also can be used to visualize time lapses between events, tasks, activities durations and the simultaneity or overlap of spans, activities and events to ensure sustainability of road construction projects

5.4.4 Project Deliverables Management

The study findings indicate that project deliverables management is the ultimate value in sustainability of road construction projects by delivering long term valuable goals that benefits all stakeholders. The researcher recommends the use of project deliverable management to set (S.M.A.R.T) goals that are sustainable to the present and future generations and the deliverables should characterize the functions of the project.

Further, the researcher recommends project deliverable management to be used as long term sustainable strategy for product development and to be given to either an external or internal customer that satisfies project milestone or due date that is created and produced in the project planning. The contractor should practice project deliverable management to enable them deliver

valuable goals in project to enhance sustainability of road construction projects. The project deliverable management should remain a key guide in accomplishing tasks in pursuance to established goals that are effective and beneficial to the society and in consideration of the environment and sustainability

5.4.5 Project Evaluation Management

The study findings indicate that project evaluation management is the determinant factor in project planning in supporting sustainability of road construction projects. The researcher recommends that, project evaluation management should be a continuous exercise in a periodic chart to aid in monitoring, evaluating and auditing projects that assist in reviews and recommendations of all elements of project planning. Project Evaluation management should be used as a project planning tool in determining systematic structured interpretation and giving of meaning, answers to the predicted to the actual impacts of proposals, goals, deliverables or results by carrying out systematic, rigorous, and meticulous application of scientific and project planning methods to assess the design, specification, implementation, improvement, or outcomes of projects to enhance sustainability.

More so, project evaluation management should carry out critical assessment of objectives and goals by quantitatively measuring predetermined and external concepts of road construction projects through provision of information. This helps to improve products and processes through monitoring and ensures effectiveness of the project. Also, project evaluation management would benefit in carrying out systematic continuous audits in operations and in management and effective measures to certify compliance of project planning.

5.5 Suggestions for further research

Further research is advised for better conceptualization of project management planning and in other different variables like safety and maintenance, environmental programs among others in the subject to enhance long term sustainability on road construction projects.

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